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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

ROBERT SCHOELZEL Plaintiff, vs. ASBESTOS DEFENDANTS, et al. Defendants.	No. C 08-03113 JSW DECLARATION OF RICHARD M. GRANT IN SUPPORT OF PLAINTIFF'S RESPONSE TO CARRIER CORPORATION'S OPPOSITION TO MOTION FOR REMAND Date: November 7, 2008 Time: 9:00 am Court: 2, 17th Floor

I, RICHARD M. GRANT, declare:

1. I am an attorney at law duly licensed to practice before the courts of the State of California and am a member of the firm of Brayton❖Purcell LLP, attorneys of record for plaintiff herein. I have personal knowledge of the following facts and, if called upon to do so, could and would competently testify thereto.

///

2. Attached hereto as Exhibit A is a true and correct copy of "Table I - Materials for pumps", pg. 18 of Mil-P-17840B(SHIPS).

3. Attached hereto as Exhibit B is a true and correct copy of "Uniform Labeling Program - Navy", dated 9/24/56.

4. Attached hereto as Exhibit C is a true and correct copy of "Occupational Health Hazards; Release No. 29" distributed by the United States Department of the Navy on October 19, 1961.

5. Attached as Exhibit D is a true and correct copy of "Industrial Hygiene and the Navy in National Defense" written and presented by Captain Ernest W. Brown, M.D. in November, 1940.

6. Attached hereto as Exhibit E is a true and correct copy of the "Ruling on Motion to Remand" in the matter of *Fortier v. Ampco-Pittsburgh Corp. et al.*, United States District Court for the District of Connecticut, Case No. 3:07-cv-00005 (WWE)

I declare under penalty of perjury that the foregoing is true and correct. Executed this 13th day of August, 2008 at Novato, California.

RICHARD M. GRANT

EXHIBIT A

EXHIBIT A

Table I - Materials for pumps.

Application	Material	Specification	Applicable document[3] [4] [5]
Casings	Gun metal Valve bronze Copper-nickel alloy (70-30) Nickel-copper alloy Steel, highly alloyed[1]	MIL-M-16576 MIL-B-16541 MIL-C-20159 QQ-N-288	ASTM B143, Alloy 1A or 1B ASTM B143, Alloy 2A-B61-52 ACI CN-7M
Studs, bolts nuts	Nickel-copper alloy, rolled, class A or B Naval brass Manganese bronze, class A or B	QQ-N-281 QQ-B-637 QQ-B-728	ASTM B164, Class A or B ASTM B124, Alloy 3-B21-54, Alloy A ASTM B138, Alloy A or B - B124-55, Alloy 4
Impellers	Gun metal Nickel-copper alloy[1] Copper-nickel alloy (70-30) Steel, highly alloyed	MIL-M-16576 QQ-N-288 MIL-C-20159	ASTM B143, Alloy 1A or 1B ACI CN-7M
Impeller and casing wearing rings[2]	Nickel-copper alloy[1] Gun metal Bearing bronze, grade II or III Valve bronze Steel, highly alloyed Iron, class A (ductile Ni-resist)	QQ-N-288 MIL-M-16576 MIL-B-16261 MIL-B-16541 MIL-I-18397	 ASTM B143, Alloy 1A or 1B ASTM B143, Alloy 2A - B61-52 ACI CN-7M
Shafts	Nickel-copper alloy, rolled, class A or B Nickel-copper-aluminum alloy	QQ-N-281 QQ-N-286	ASTM B164, Class A or B
Shaft sleeves	Nickel-copper-aluminum alloy, minimum hardness 265 Brinell Steel, highly alloyed	QQ-N-286	 ACI CN-7M
Flinger	Gun metal Valve bronze	MIL-M-16576 MIL-B-16541	ASTM B143, Alloy 1A or 1B ASTM B143, Alloy 2A - B61-52
Lantern rings, glands and throat bushings	Gun metal Valve bronze	MIL-M-16576 MIL-B-16541	ASTM B143, Alloy 1A or 1B ASTM B143, Alloy 2A
Mounting brackets	Gun metal Valve bronze Copper-nickel alloy (70-30)	MIL-M-16576 MIL-B-16541 MIL-C-20159	ASTM B143, Alloy 1A or 1B ASTM B143, Alloy 2A - B61-52
Impeller nuts	Gun metal Nickel-copper alloy	MIL-M-16576 QQ-N-281	ASTM B143, Alloy 1A or 1B ASTM B164, class A or B
Stuffing box packing	Plastic metallic, lead base Flexible metallic	MIL-P-17303 class 1, type B MIL-P-17416	
Casing gaskets	Asbestos, sheet, compressed	MIL-A-17472	

[1] For service in which total head is 324 feet or more.

[2] A wearing ring and its opposing surface shall be of dissimilar material.

[3] "ASTM" denotes standard specifications of the American Society for Testing and Materials. (Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia 3, Pa.).

(Continued on next page.)

EXHIBIT B

EXHIBIT B

UNIFORM LABELING PROGRAM- NAVY
9/24/56 J.

DEPARTMENT OF THE NAVY
Office of the Secretary
Washington 25, D. C.

SECNAV [illegible]
[illegible]-7231-bar
24 September 1956

SECNAV INSTRUCTION [illegible]

From: Secretary of the Navy
To: Chief of Naval Material
Chief of Naval Operations
Chief of Naval Personnel
Chief of Naval Research
Chief, Bureau of Aeronautics
Chief, Bureau of Medicine and Surgery
Chief, Bureau of Ordnance
Chief, Bureau of Ships
Chief, Bureau of Supplies and Accounts
Chief, Bureau of Yards and Docks
Commandant, U. S. Marine Corps
Commander, Military Sea Transportation Service

Subj: Uniform labeling program for hazardous industrial chemicals and materials

Encl: (1) Markings and Designs of Labels
(2) Tentative Label Classification Guide
(3) Elements of a Labeling Program

1. Purpose. The purpose of this Instruction is to standardize on labeling requirements for hazardous chemical products during the using stage, and to provide selective labels which will contain pertinent information designed to warn users of the potential dangers involved.

2. Scope. This Instruction applies to the labeling of all hazardous materials throughout the Naval Establishment wherever distribution of hazardous chemicals and materials is made to the actual consumer (shop, office, or unit). It applies to materials received from any supply source, provided the material is intended for ultimate use at the local activity. In this regard it refers to labeling of the original container as well as any other container to which the material may subsequently be transferred. This Instruction is not intended to govern:

a. The type of labels to be affixed by the manufacturers. (These are governed by State and Federal laws and regulations depending on the nature of the material and whether the shipment is interstate or intrastate. In addition, most major manufacturers of chemicals abide by the "Warning Labels Guide" published by the Manufacturing Chemists' Association.)

SECNAVINST 5100.5
24 September 1956

OFFICE OF THE SECRETARY

b. The type of labels to be affixed to containers of chemicals or drugs used, or dispensed, by medical department pharmacies.

c. Those chemicals used by clinical or chemical laboratories, where small quantities of the chemicals are to be used as reagents by trained personnel who are familiar with the potential hazards involved. (The exempted laboratories will be those designated by the various bureaus, offices, and Marine Corps.)

d. The labeling of explosives, gasolines, and fuels, and compressed gases. (These are adequately covered by current instructions.)

3. Background. The rapid development of new chemical products and the introduction of new chemical processes make it mandatory that precautionary measures be taken during the handling of toxic and dangerous chemicals. Warning labels affixed to containers of hazardous chemicals are one of the most practical means of accomplishing this objective. This Instruction is based on a composite of the procedures recommended by the Manufacturing Chemists' Association, the International Labor Organization, the American Conference of Governmental Industrial Hygienists, the Atomic Energy Commission, and the labeling programs presently in effect at the Naval Gun Factory, the Alameda Naval Air Station, and the Mare Island Naval Shipyard.

4. Action

a. Navy Department Standardization Office. The Navy Department Standardization Office shall effect the assignment of a limited coordination military (Navy) project in connection with this Instruction to standardize the printed labels in respect to quality of paper, size, color, shape; insignia, wording, and design; quality of the glue; specifications for inks (including colors of inks); and other related matters. Enclosure (1) summarizes the markings and designs for labels agreed upon by representatives of the bureaus and offices.

b. Bureau of Supplies and Accounts. The Bureau of Supplies and Accounts shall initiate procedures to have the necessary labels stocked as General Stores items for use by all naval activities.

c. The Technical Bureaus. The classification of hazardous chemicals and materials shall be accomplished through the joint efforts of the technical bureaus in that each Bureau shall be responsible for passing on those aspects, of any single item, which fall within its technical purview.

OFFICE OF THE SECRETARY

SECNAVINST 5720.8
24 September 1956

6. Safety Precautions Board. The Safety Precautions Board shall:

(1) Publish in Safety Precautions (OPNAV 34-P1) a "Label Classification Guide" listing the classification of hazardous chemicals and materials currently in use as determined by the appropriate technical bureau or office.

(2) Revise the "Label Classification Guide" in accordance with information concerningly provided by the responsible technical bureaus and offices relative to the use of new chemicals and proprietary materials, deletions, and changes in classifications.

7. Bureaus, Offices, and Marine Corps. The bureaus, offices, and Marine Corps, shall initiate implementing instructions for use by activities under their management control upon completion of action required by paragraphs 4a, 4b, 4c, and 5d(1), above. Enclosure (3) is an outline of the "Elements of a Labeling Program" for guidance.

P. A. FOGLER

EXHIBIT C

EXHIBIT C

DEPARTMENT OF THE NAVY
BUREAU OF MEDICINE AND SURGERY
WASHINGTON 25, D.C.

IN REPLY REFER TO
BUMED-732-mh
6260
19 Oct 1961

From: Chief, Bureau of Medicine and Surgery
To: Activities Submitting Occupational Health Reports (NavMed 576)

Subj: Occupational Health Hazards; Release No. 29

Ref: (a) MANMED 23-21

Encl: (1) List of Occupational Health Hazards (April - June 1961)

1. The Quarterly Occupational Health Hazards Reports (NavMed 576) for April through June 1961, submitted in accordance with reference (a), have been reviewed by the Occupational Health Division (Code 73). Potential health hazards of special interest have been selected from these reports and are forwarded herewith as enclosure (1).

2. The compliation contained in enclosure (1) is intended as a ready reference to current problems, and in some instances will avoid duplication in the solution of these problems. It is also intended to aid Medical Department personnel in the recognition of potentially hazardous materials and processes. Further information regarding specific hazards noted in enclosure (1) may be obtained from the originating activity.

3. The information contained on the composition of materials is to be treated as manufacturer's "Discreet" proprietary information, in accordance with SecNav Instruction 5570.1A of 6 April 1957. It is to be used solely for the control of potentially toxic materials and is not to be released for any other purpose.

E. C. KENNEY

Copies to: (2 each)
NDS&RCS
INSNAVMEDACTS
Chiefs of Bureaus
CNO (OP281)
MSTS
CMC

FILE IN E S CORRES. FILES

OCCUPATIONAL HEALTH HAZARDS
Derived from Industrial Health Reports
April 1961 through June 1961

Release No. 29 For Official Use Only

I. Chemical Health Hazards and Their Control

A. Inhalation Hazards Due to Vapors, Fumes, Mists, Gases and Dusts

1. Asbestos Dust. Survey was completed of pipe covering and insulation section. The survey included layout and cutting, molding operations, and sewing of boots and jackets. The layout and cutting are the dustiest operations in the shop. During the handling and unrolling of the asbestos, considerable dust is generated, but appears to settle rapidly. During the layout and cutting, a fine water spray is used for wetting down. Once the asbestos is wetted, the cutting causes very little dust. In addition to this control, ventilation is provided for the operation. Total dust count after wetting and cutting was 2. million particles/cubic foot. (PNSY)

2. Asbestosis. In 1958, a study was begun on pipecoverers (asbestos) working conditions. Chest x-rays and vital capacity test were conducted on asbestos workers. At that time, we had one former employee receiving compensation for asbestosis. According to NCPI 792, pipecoverers are to receive a chest x-ray annually. At LBNS it was decided to give these employees a chest x-ray every six months, alternating a 70 mm with a 14x17. A vital capacity test, using McKesson-Scott equipment, has been given annually. A record has been kept of employees with "remarks" on their 14x17's. (LBNSY)

3. Cadmium Fumes. Certain cable terminal sockets used aboard ship are cadmium plated as a corrosion deterrent. In securing these sockets to cable ends, it is the practice to preheat the sockets prior to pouring the molten zinc into the socket. An acetylene torch is usually utilized for this purpose. Investigation was made of this procedure aboard ship. Ventilation was provided by one five-inch exhaust duct leading to a portable exhaust fan. Air velocity appeared good, rapidly removing visible fumes. The man using the torch wore a metal fume respirator. Other personnel in the compartment did not use protective gear. During the heating of the socket, it was observed to discolor, giving evidence that the cadmium plating was being burned off. Electrostatic precipitator samples were taken and analyzed. Visible deposits resembling cadmium oxide were noted in all cases in the precipitator tubes. Analysis of the samples revealed a concentration of cadmium oxide in the inhalation zones of personnel of 2.1 and 2.4 milligrams per cubic meter of air, 21 to 24 times the threshold limit value of 0.1 milligrams per cubic meter. It was recommended that local exhaust ventilation and air-supplied respirators or metal fume respirators be used. (PSNSY)

4. Cadmium Fumes in Silver Brazing. The master of the Pipe and Copper Shop expressed concern over possible health hazards involved in the use of a silver solder in brazing operations by his shop. An investigation was made to determine the methods of use and concentrations of any toxic or hazardous materials which may be formed in the process.

Silver solder is used to braze the joints of piping installed aboard ships. For the majority of joints silver solder #3 is used. Where piping passes through a bulkhead from one compartment to another a steel sleeve is brazed around the pipe to provide an air tight fit. At these points silver solder #4 is used. The silver solder is applied in the following manner. The joint to be brazed is brushed with a paste flux. Then it is heated with an oxy-acetylene torch. After the proper temperature has been reached the silver solder is melted and allowed to run into the joint. The operation takes about 5 to 10 minutes with approximately one half of the time spent in heating the work before the application of the silver solder. Larger joints such as those 6 inches or more in diameter will take somewhat longer.

The major hazard arises when silver solder #4 is used. This solder has cadmium as one of its constituents, whereas silver solder #3 contains no cadmium. Since cadmium vaporizes readily at the temperature of an oxy-acetylene torch there could be a substantial amount of this metal in the air.

Air samples were taken at various locations aboard ship and in the shop area while the brazing operation using the solder containing cadmium was being performed. These samples were subsequently analyzed for cadmium content to determine the concentrations of cadmium oxide fume both in the operator's breathing zone and in the immediate area around him.

The air was sampled only during the period that the solder was in a molten state and did not include the preheating period before the application of solder. No exhaust ventilation was used for any sample. All brazing was on copper and brass unless otherwise specified.

The samples were collected on Whatman #41 filter paper using a high volume air sampler at rates of 8-14 cubic feet per minute. The determination of cadmium was made using a dithizone extraction according to the method of B. E. Saltzman, Anal. Chem. Volume 25, P. 493, March 1953. The results indicated that in some operations the concentration of cadmium oxide is significantly above the MAC of 0.1 mg/M^3 and that respiratory protective devices and local exhaust ventilation is necessary. (NYNSY)

5. Cresol Vapor. A study was conducted of an aircraft engine parts cleaning shop to determine the concentrations of cresol vapors and aerosols in the air. Under normal conditions, phenols and cresols are not considered inhalation hazards, but under conditions in the shop, vapors and aerosols are liberated by air movement, escape of volatiles, and cleaning of parts by steam or solvents under pressure. A total of 948 sampels were collected during 85 days by means of a sequential sampler, and 255 of these

samples were threshold limit or above. In two locations the limit was exceeded by 31% and 41% of the samples collected. At one location the average daily concentration exceeded the threshold limit on six days and at another location, seven days. The highest concentrations were found to be from 0700-0900 and 1200-1400 during the day. During the winter most doors and windows are closed and the ventilation is by leakage. Recommendations have been made for the ventilation of one process. (NASP)

6. Epoxy-Polyamine. Spray painting of aircraft has now been performed on a production scale for six months without any cases of skin irritation or sensitization among the painters. This good record is the direct result of strict adherence to the hygienic precautions developed for this operation. (NASA)

7. Epoxy Resin Accelerator. A workman reported to the Dispensary with a severe headache which he attributed to exposure to an experimental sample of Epoxy Resin. Two one-half pint cans were furnished to the Shipyard by the Minnesota Mining and Manufacturing Company for experimental lamination of steel. The contents of the two cans were mixed and applied in the open air. The exposure time was less than 15 minutes. The can containing the accelerator had an ammoniacal ordor. The vapor turned red litmus blue. The base contained ethyl acetate. Information on the type of amine used in the accelerator has not been supplied by the manufacturer. While it appears doubtful that the limited exposure could have caused the alleged symptoms, arrangements have been made to follow closely further experimental applications of resins of this type. (SFNSY)

8. Eye Injury From Paint Remover. A sailor, who splashed paint and varnish remover in his eyes, received 1st degree burns of the cornea. Recovery was complete after a few days on the hospital ship USS HAVEN. The paint remover was methylene chloride which is very dangerous to the eye. Protective clothing and goggles must be worn. (LBNSY)

9. Gasoline, Fire. A variety of high test fuels are used in checking parts in the carburetor test shop. A faulty electrical connection caused an explosion and fire in the shop. The four men working in the shop received only minor burns but the blast blew open a door and a passing mechanic was engulfed in flames, resulting in critical injuries from second and third degree burns of the head, face, neck, trunk and extremities. The accident was caused when the reverse polarity of a defueling pump created a different potential between the pump housing and the test stand, causing an arc, which set off explosion. (NASP)

10. Hydrogen Sulfide. The Supervisors Coordination Center, Pier No. 1, contains an expansion joint. This opening allows the odor from decaying organic matter (hydrogen sulfide) to enter the room. The odor is especially noticeable during early morning low tides with ships heads emptying directly into the water. The condition does not present a health hazard. Due to the odor, however, the room is not used to its best advantage. The following

recommendations were suggested:

1. Seal the joint with tape or rubber gaskets.

2. Allow adequate ventilation by proper use of doors and windows, or

3. Maintain a positive pressure in the room with supply air ventilation. (LBNSY)

11. Hypochlorite, Chlorine Gas Generated in Cleaning With. Chlorine gas escaping from a head which was being cleaned resulted in temporary evacuation of an office occupied by military personnel. Concurrent use of bowl cleaner and hypochlorite resulting in evolution of chlorine gas was the cause of the disturbance. No one was significantly effected by the gas. Colored decals depicting the hazard resulting from this mixture were posted on the walls of the head. (NASSD)

12. Insulating Material on Electric Wire. An electrician reported an illness following an exposure to a fume resulting from the decomposition of insulation on an electric wire which was being used in rewiring an electric motor. Short leads were being soldered to openings cut in the cable and the soldering iron was found to be coming in contact with the coating resulting in a fume. An investigation indicated that the wire covering was composed of polyvinyl chloride. This work was subsequently transferrred to a ventilated booth and no further difficulty has been experienced. (NASSD)

13. Laminac. Evaluation was made of the hazard potential involved in the handling of Laminac, a polyester resin, by the Sheetmetal Shop. One of the additives used with the resin is antimony trioxide and recommendations were made to prevent inhalation of the latter material during mixing, handling, and grinding operations. (PHNSY)

14. Lead Coated Surfaces, Welding on. Complaints of respiratory irritation by employees welding and burning on superstructure coated with a vinyl red lead primer were found to be due to hydrogen chloride gas; concentrations of less than 1 ppm were detected and although below the permissible limit, were noticeably irritant. The lead concentration in air presented a significant health problem; 0.70 mg. per cu. meter of lead was found in the breathing zone of the welder. Urine samples of personnel on this job showed normal lead values since the work had not been done for more than a few days. It was recommended that air supplied respirators be worn when burning metal surfaces coated with lead bearing paint and that coating be removed from areas which are to be welded. It was further recommended that no coating containing lead be applied until welding and burning on these surfaces is complete. (PoNSY)

15. Lead in Sandblasting of Ships. Because of the use of lead-containing primer coatings on ship's hulls, a possibility exists of excessive lead exposure from dust created by sandblasting operations. Air samples were

taken to evaluate this possibility. Atmospheric samples were taken in a dry dock while the hulls of two destroyers were being sandblasted. Samples were taken 30 to 100 feet from the actual blasting in the visible dust cloud. Lead content of the samples ranged from 0.2 to 1.9 milligrams of lead per cubic meter of air, exceeding the threshold limit value. Sandblasters use air-line respirators. It was recommended that other personnel whose duties require them to work in the dusty area of such sandblasting operations repeatedly or for periods of time exceeding four hours, be required to wear an approved dust filter respirator. (PSNSY)

16. Lead In Torch Cutting of Ships. The literature lists a number of cases of lead poisoning occurring in private industry where obsolete Naval ships are being scrapped. Paint scrapings were taken from a discarded FRAM superstructure at this activity and analyzed for lead. 3.1 percent of lead was found. It is considered, therefore, that torch cutting of these scrapped superstructures present a lead hazard. Atmospheric samples will be taken at the next opportunity during work of this nature. (PSNSY)

17. Magnaflux or Sonoflux magnetic inspection powders do not significantly increase concentrations of toxic gases and fumes when welding or burning on metal surfaces treated with these powders. Complaints of discomfort of employees working in Magnafluxed tanks, particularly where the gray powder had been used, initiated a study of the operation which included analysis of the powder and environmental air sampling. The powders contain iron as a principal constituent; the red powder is colored by a red dye and the gray powder has 7% titanium to impart the gray color. Fume and gas concentrations are not significantly higher where Magnaflux powders were used; however, sampling did disclose excessive concentrations of carbon monoxide (200 to 400 ppm), oxides of nitrogen (2 to 17 ppm) and iron fumes (50 to 83 mg. per cu. meter), typical of welding and carbon arc gouging in confined spaces. The following health precautions were recommended:

a. Provide all confined spaces with adequate exhaust ventilation.

b. Air supplied respirators should be mandatory for all carbon-arc gouging operation.

c. Accumulations of magnetic inspection powder shall be removed before welding or burning operations are started. (PoNSY)

18. Mercury. A health survey was conducted in the Electronics Shop. Electronic switches and conductors are treated with a mercury amalgam solution. The amount of mercury used and the manner of its use presented no health hazards to the employees. (PNSY)

19. Toluene Diisocyanate. Foam-in-place polyester-difsocyanate core material, specification MIL-C-8087B (ASG) is used in the Plastics Shop to stiffen some of the fins in aircraft radar systems. A pint glass bottle of the TID component was accidentally dropped on the concrete deck. In a

short time eye and respiratory tract irritation among the personnel in the room became so severe that the room had to be evacuated and force ventilated. Two hours after the incident the TID concentration in the room air was 0.65 parts per million. The aeration was continued overnight and the deck was thoroughtly flushed with strong ammonia solution. The air was free from toluene diisocyanate in the morning. No delayed reactions developed among the exposed personnel. (NASA)

20. Trichloroethylene was being used for cleaning an oxygen line extending from a vessel in a Dry Dock to a centrally located oxygen supply line between the Docks. Supervisors were reminded of the potential hazard of trichloroethylene and the operation conducted without incident. Compressed nitrogen was used to evaporate the residual trichloroethylene from the line. (SFNSY)

21 Confined Space Incidents

a. Airline Respirator for Protection Against Dust in Confined Space. Two sailors assigned the task of wire brushing several fresh water tanks aboard a vessel in port complained that the dust produced was causing great discomfort in spite of the twin cartridge dust respirators which they were wearing. After investigating the condition, it was recommended that they be provided with airline respirators and that exhaust ventilation be arranged if possible. (BNSY)

b. Zinc Fumes. One employee working as a welder's helper aboard the USS CARBONERO was treated at the Dispensary for symptoms resembling those of metal fume fever. Subsequent inspection revealed the probable cause to be zinc fumes during the welding of brackets, although the burn-off of vinyl paint residuals prior to welding undoubtedly also contributed to the situation. The need for respiratory protection in all welding operations in poorly ventilated areas was emphasized. (PHNSY)

c. Paint. Two sailors were given treatment at the Dispensary after having been overcome by paint vapor while working in the forward ammunition storage areas aboard a Naval vessel. The incident was caused by the spillage of approximately five gallons of a "Coating, pretreatment, Formula 117" in a poorly ventilated area. The material is made up of the following chemical constituents: pigment - zinc chromate, magnesium silicate, and lamp black; vehicle - polyvinyl-butyral resin in butyl and ethyl alcohol. Acid component - phosphoric acid, water, and ethyl alcohol. Appropriate recommendations were made for effective ventilation requirements and respiratory protection to prevent a recurrence. (PHNSY)

d. Solvent Spraying. Navy personnel were engaged in spraying trichloroethylene in a fire room of a ship. A generator armature was placed on the grating of the fire room floor and the trichlorethylene was sprayed from above and below. No ventilation or respiratory protection was utilized. One man was rendered unconscious and the other became violently ill. Since the men were taken directly to the Naval Hospital, the Industrial Hygiene Division was not notified until some time after the occurrence. An air

sample taken with the Kitagawa sampler about twenty minutes after the men were removed showed about 100 ppm trichlorethylene in the exposure area. The hazards associated with the use of solvents, proper control measures, and safe work practices in the use of solvents were emphasized. The spraying operation was discontinued. (PSNSY)

e. Void Space Around Shipboard Gasoline Tanks. Two workmen removed access covers from the top of voids adjacent to the Gasoline tanks. After the Gas Tester has certified that the void was free of exposure hazards one of the workmen entered the void. The other was about to enter when he noted that this fellow workman had collapsed at the bottom of the space. He immediately went to help. Service personnel wearing Rescue Breathing Apparatus performed the rescue operation. The man recovered without incident.

Action was taken to assure that oxygen tests are made in the future as required by regulations. The void tanks surrounding Gasoline storage tanks are normally inerted with nitrogen from the shipboard oxygen manufacturing system. (NSYSF)

f. Sewer Manhole. A worker in a sewer manhole, while dislodging an obstruction, lighted a cigarette and ignited flammable gas. Several manhole covers on the line were blown-off and the worker was severaly burned. Tests of several manholes on this line showed explosive concentrations of gas but practically no hydrogen sulfide. The explosive gas is believed to be methane from septic sewage. Any source of methane other than the sewage was not identified. Tests of manholes on other sewer lines showed no explosive gas concentrations and very little hydrogen sulfide. Testing for gas in sewer manholes had been discontinued as no positive tests had been obtained for several years. Testing for gas will be done before any worker is permitted to enter a manhole. (NOTS)

B. Ventilation and Other Industrial Hygiene Control Measures

1. Aluminum Cleaning Operation. A request was received for an industrial hygiene review of the proposed aluminum cleaning facility on the Shipyard. It was found that a potential health hazard would exist in the planned use of a cleaner containing phosphoric acid and butyl cellosolve. The latter has a Threshold Limit Value of 50 ppm. Although this concentration is seldom achieved at room temperature, because of the solvent's low volatility at the elevated temperatures planned for the operation in question (140°F), such concentration could be readily achieved. The solvent is also flammable and has a flash point precariously close to the temperature of use.

It was recommended that local exhaust ventilation be provided to forestall personnel expsoure and to control excessive humidity. It was also suggested that a push-pull system be considered for the solvent tank. (MINSY)

2. Beryllium. The Industrial Hygienist was requested to investigate the potential health hazard due to beryllium at NAVORDLAB Corona. Chemical studies with this material are performed under an exhaust hood or in a dry box. The hoods and dry box are filtered with a roughing filter for large particles plus high efficiency AEC type filters. Wipe samples and air samples are taken on a continuing basis by laboratory personnel. These samples are analyzed by a contract laboratory and, to date, all have been within the MAC.

The MAC for "neighborhood" concentrations of beryllium is .01 micrograms per cubic meter. The filters contained in the beryllium exhaust system must keep the "neighborhood" beryllium below this level. Wipe samples beyond these filters indicated some beryllium was passing. Most of this was possibly due to inadequate installation, which has been corrected. Air samples now indicate the beryllium is being properly filtered, a requirement due to the hazardous nature of this material.

The ventilation system of the laboratory is being improved. There is some concern about this new ventilation intake being located less than ten feet from the beryllium hoods exhaust. The wind direction and velocity are uncertain. There could be no assurance the additional safety precaution of relocating the exhaust would be effective, even in the event of a ruptured filter. The following recommendations were made:

(1) Leave the beryllium exhaust stack in its present location.

(2) Continue performing wipe and air sampling inside and outside the laboratory.

(3) Cut access openings beyond the filter in the exhaust ducts to allow for both air and wipe sampling. (LBNSY)

3. Chemical Warefare Agents; Disposal of . The Chemistry Branch of the Material Laboratory informed this office that the air filters on four laboratory hoods were to be replaced and the old ones destroyed by incineration. These hoods were used for work involving highly toxic chemical warfare agents of the organic phosphate type. Arrangements were made to be present when the filters were placed in the incinerator. The old filters were placed in polythylene bags and sealed with tape. These were then placed in cardboard containers and sealed with tape. A representative of the Material Laboratory was present with a monitoring device during the entire procedure of incineration. At no time were any detectable amounts found in the atmosphere. (NYNSY)

4. Chrome Plating Tank. Chromic acid mist from two recently relocated plating tanks was found to reach a level of 0.3 and 0.15 mg. per cubic meter of air at the breathing zone level. Although the tanks were 36 inches wide, slots were installed on one side only. Ventilation rates on the two tanks were found to be 75 and 88 cfm. per square foot of tank surface. It was recommended that slots be installed on 2 sides of each tank and that a minimum of 120 cubic feet of air per square foot of tank surface be provided

for ventilation. (NASSD)

5. Dry Ice. Freeze seals using dry ice or liquid nitrogen at the rate of 10 pounds per 8 hour shift require minimum exhaust ventilation of 200 cfm, positioning the 3" hose within 1 foot and preferably below the seal. Gas-free inspectors were authorized to make the following tests:

a. Tests for carbon dioxide are to be made at fifteen minute intervals for the first hour of freeze and one hour intervals thereafter. Personnel shall be evacuated when the carbon dioxide concentration reaches 1.5% and shall not be allowed to return until ventilation has reduced the concentration to 0.5% or less.

b. Oxygen tests are to be made on the same frequency as carbon dioxide tests. Personnel shall be evacuated when the concentration of oxygen in the atmosphere is 17% or less. (PoNSY)

6. Ethyl Acetate. An investigation was made of ethyl acetate vapors in air during application of plastic vibration damping sheets on a ship. Ventilation was provided by a two-foot circular hole through the hull at floor level through which a three-inch exhaust duct entered. Two five-inch exhaust ducts entered through the compartment door. Four men worked in the compartment. Two wore disposable plastic gloves while handling the contact cement, which is manufactured by Minnesota Mining and Manufacturing Company, and contains ethyl acetate as a solvent. A calibrated combustible gas indicator was used for air tests. The following concentrations of ethyl acetate were found: breathing zone of worker painting cement on sheets, 792 ppm; breathing zone of worker applying sheets to bulkhead, 594 ppm; average amount in work-site atmosphere, 660 ppm. The threshold limit value for ethyl acetate is 400 ppm. Since the exposure was excessive, it was recommended that additional ventilation be provided by the use of a large air mover attached to the opening in the hull. This was installed and solved the problem. (PSNSY)

7. Gasoline Vapor In Plane Cockpit. It was reported that a fuel vapor leak in a T58 twin-seat single engine propeller plane was causing distress to the pilot. Ground and flight tests revealed no significant concentration of vapor as indicated by the David Vaportester. Pressurizing the fuel tanks with nitrogen also failed to reveal any leakage from the source. An improved closure of the cockpit is planned to exclude any access by raw gasoline. (NASSD)

8. Graphic Recording Device, Offensive Odor in Operation. Avionics employees engaged in shop overhaul and repair of graphic recording devices which produce lines on treated paper by passing an electric arc through the paper complained of the offensive odor produced when recorders are in operation. Several employees were of the opinion that the fumes were the cause of occasional headaches. The device is equipped with a small integral exhaust system for the removal of the fumes from the source. However, the exhaust discharges into the cabinet which contains the recorder and associated devices. (This serves

to reduce the concentration by dilution). The unit is airborne equipment. There are provisions for exhausting the cabinet to the outside atmosphere while in flight but no provisions when operated while the plane is on the ground. The fumes emitted by the arc have a sulfur or mercaptan odor. Tests for hydrogen sulfide were negative. Carbon monoxide was present to the extent of 10 ppm in the area immediately above the arc when the exhaust fan was secured. It was concluded that the fumes did not constitute a health hazard. However, it was suggested that portable exhausts discharging to the outside could be used to remove the obnoxious fumes from the cabinets. (NASN)

9. Lead. Extensive lead processing is being performed during the conversion of the USS SPERRY to a nuclear submarine tender. Shipyard personnel have had previous experience in this work during the conversion of the USS NEREUS. All personnel subject to expsoure to lead fumes and dust were given a urine porphyrin examination before lead work was begun. This examination will be repeated after completion of the ship overhaul. Protective clothing including coveralls, gloves, metal fume and dust respirators are furnished these employees. (LBNSY)

10. Lead. A survey was conducted of a lead burning operation in the Pipe and Copper Shop. The operation involved the reconditioning of coolers. The process consists of removing old solder by burning out with a torch and then replacing it with new solder. Atmospheric samples taken show that the burning out process expose the workers to lead fumes above the hygienic standards. In addition the ventilation for the soldering operation was inadequate. The recommenations for improving the present exhaust system were carried out and the entire operation is now conducted in a safe manner. (PNSY)

11. Mercury, Control Measures. A reappraisal of the Liquidometer room was made to determine air concentrations of mercury vapor. Since mercury-gauge manometers and instruments are periodically cleaned and refilled in this room, small amounts of mercury occasionally spill and settle in cracks and crevices of the floor. Readings as high as 0.1 mg per cubic meter were found at certain areas of the room. It was requested that a suction type device be used to trap the spilled mercury from the floor and work benches. (BNSY)

12. Mercury, Control of Hazard. The Small Hand Tool Section of the Central Tool Services Shop periodically performs maintenance on compartment testers containing mercury. Considerable spillage of mercury occurs during the emptying and refilling of this equipment and therefore a portion of the shop area is being set aside specifically for mercury handling. The required renovations to the area to adapt it to mercury handling include smoothing a portion of the concrete floor and rendering it impervious with a coat of epoxy resin; rimming this floor area with a stainless steel catch basin; fabricating a stainless steel bench which is to be used exclusively for mercury contaminated equipment. During the preparation of the area by surface grinding, one air sample was obtained of 0.07 mg Mercury/M^3. (PHNSY)

13. Metal Plating Shop; Built-in-Safety. A new consolidated plating shop is almost complete. The Industrial Hygienist participated in planning and designing of this shop throughout its development. Checkout of the ventilation systems prior to acceptance revealed some rather serious shortcomings; these were substantially corrected by the contractor at no additional cost to the Navy. Participation of Industrial Hygienists in planning and designing for new processes and changes can insure better operation of projects requiring controls for health and reduce the frequency of costly additions or later changes. (NASJ)

14. Methyl Bromide, Cylinder Storage. The Supply Department continues to receive fire extinguisher bottles containing methyl bromide. This agent has been replaced by non-toxic trifluorobromo methane. It was found that methyl bromide cylinders in excess of 200 were stored in the flammable storage building and that many of the bottles had not had the ordnance removed. (There had recently been a fire in an area immediately adjacent). It was recommended that all bottles be disarmed immediately and that all bottles be equipped with shipping caps to prevent accidental rupture of the diaphragms. (NASN)

15. Aluminized Hoods and Air-Fed Suits for Welders Working in High Temperatures. The Industrial Hygiene Division has suggested the use of aluminized hoods and air-fed suits for welders exposed to high thermal stress conditions aboard nuclear submarines. Three suits were ordered for experimental purposes, were tested by welders under actual working conditions, and were found to be effective as protection against excessive heat. Consultations are now in progress between the manufacturer and the Medical and Production Departments at Mare Island, relative to certain modifications suggested as a result of this trial. It is intended that the ultimate protection will be provided by an air-fed all aluminized suit. Arrangements for trial of the latter have been made, and delivery is awaited. (MINSY)

16. Rubber Adhesive; precautions in use of. Several compartments aboard a destroyer undergoing conversion in the FRAM project were required to have acoustical dampening material installed. The operation consists of covering the bulkheads with rubber-like tiles held in place by an adhesive.

An inspection was made abpard the ship accompanied by representatives from the Safety Division and Shop Supervision.

The adhesive to be used was the following:

GF 8040-273-8697
ADHESIVE, RUBBER
SYNTHETIC RUBBER BASE
SPEC MIL-A-5092 A (AER) TYPE III
FIRESTONE TIRE & RUBBER CO.
LOXITE 7030

There was a warning label on the container stating that the adhesive was flammable. The adhesive is applied to an entire bulkhead at a time by brush. After fifteen minutes, when it has become tacky, the tiles are set into place. A sample of the adhesive was collected and analysis revealed it to consist of a mixture of acetone and methyl ethyl ketone and

about 5% low boiling naphtha.

It was recommended that the men doing the work wear air-supplied respirators and protective gloves and the same precautions against explosion or fire be followed as in the application of Saran Coatings. Vapor-proof lights are to be used; air-supplied to the compartment for dilution purposes, air exhausted from the compartment to a safe point outside of the ship, and cutting, burning or welding prohibited in adjacent compartments. (NYNSY)

17. System for Degreasing Electrode Wires. It is necessary that reels of consumable electrode wire for Aircomatic welding be cleaned of all grease and foreign material. An aluminum box has been constructed with spring finger scrapers through which the wire passes. The box is filled with trichloroethylene as a degreasing agent. The wire enters and emerges from the box through gasket-type seals so that no leakage of the solvent is possible. The box is covered and a local exhaust duct is placed over the box. As the wire emerges from the box, it is wiped by hand using paper towels or a rag. Under this procedure, there is no undue exposure to trichloroethylene vapor. (PSNSY)

18. Ventilation. The Industrial Hygiene Division cooperated with the Temporary Service Shop in development of process sheets showing the air flow of all blowers used for temporary ventilation under varying lengths of ductworks. (PoNSY)

19. Trichloroethylene in Boiler System Cleaning; Control of Hazard. Several hundred gallons of trichloroethylene were pumped into the boiler systems of a destroyer in port to degrease a preservative compound used during storage of the tubes. The solvent was pumped into the distilling units from fifty gallon drums and heated by means of coils. Upon completion of the degreasing phase, the solvent was pumped back into the drums, and the units flushed with water. A similar operation of this nature in the past had resulted in several men making claims of over-exposure to tricholorethylene while removing the remaining sludge from the boilers. Solvent underlying small pools of water had remained in the boiler compartment and was not detected until workers had agitated these pools while wiping the surface.

To avoid a reoccurrence of this hazard, the Industrial Hygiene Division designed a small device to draw the solvent remaining after flushing with water into a five gallon closed container. The device consisted of a hand pump attached to copper tubing of sufficient length to reach the entire boiler tank. Personnel working in the boiler were required to wear charcoal filter respirators. (BNSY)

20. Trichlorethylene as Cleaning Agent in Welding. The use of trichloroethylene as cleaning agent by welders has been investigated and the following instructions have been recommended:

a. Organic cartridge respirators must be worn when using more than 3 ounces of trichloroethylene per hour.

b. Adequate ventilation to remove vapors shall be provided.

c. No welding or burning shall be done when the odors of this solvent are noticeable.

d. Neoprene gloves shall be worn by personnel using the solvent.

e. Substitution of a less toxic solvent, methyl chloroform. (PoNSY)

C. Health Hazards Due to Contact with Skin

1. Fiberglas. Dermatitis developed among several officers and enlisted men building boats in the Hobby Shop. The exposure was most severe during power sanding of the fiberglas-plastic laminated surfaces. It was recommended that personnel contemplating "do it yourself" work with fiberglas be required to familiarize themselves with local instructions which outline the safe methods of work and the needed hygienic measures. The more effective control method by means of exhaust ventilation at the source is not economically feasible for the Hobby Shop at this time. (NASA)

2. Fiberglas Reinforced Epoxy Resin. Employee fitting sheet plastic on superstructure developed dermatitis of face and both forearms from the physical irritation action of the fiberglas dust. Strict personal hygiene practices and washing with cold water were recommended. (PoNSY)

3. Fiberglas Reinforced Polyester Resin. An employee without previous history of skin trouble developed dermatitis of both hands, (fissuring and erythema) after drilling this plastic material for 2 days. Recurrence of swelling and erythema of both hands developed on 2 hours exposure. Patch tests are being done to determine sensitivity of this employee and recommendations for job placement. (PoNSY)

4. Fiberglas Tape. Employee developed dermatitis of both hands from wrapping bus bars with fiberglas tape. He has been instructed to wash hands and arms with skin cleaner and cold water whenever cleanup is necessary. (PoNSY)

5. Lubricating Wax. Man grinding and buffing aluminum propeller blades coated with lubricating wax developed contact dermatitis of the hands and arms. Protective skin creams and gloves were used with good results. (NASQP)

6. Oils. Solvents (Varsol) and hydraulic oils were responsible for 7 cases of contact dermatitis which were eventually under control (with the exception of 1 man) after using protective skin creams and gloves. All

affected personnel were aircraft mechanics working in different areas. One man was transferred to "dry" work for a period of one month. (NASQP)

7. Paint Stripper. This aircraft cleaner, exposed to paint stripping compounds containing cresols, chlorinated hydrocarbons, and ammonia, developed contact dermatitis of the hands. Protective skin creams and gloves were recommended. (NASQP)

8. Photosensitization, Coal Tar Derivatives. A typical photosensitization took place in one individual while working in an outdoor area in direct sunlight, building a wharf. The wood used in the piling was heavily treated with cresol and other coal tar derivatives. A barrier cream of Fend-I was recommended and no further incidents were reported. (PHNSY)

9. Polyurethane Foam Liner in Safety Helmet. An employee developed a severe dermatitis of the forehead from one hour's exposure to the liner on a bump hat. Several other employees were reported to have less severe reactions as a result of wearing of these hats. The liners were found to be thin sheets of polyurethane foam, one side of which is covered with cloth. The manufacturer recommends that the cloth side should be in contact with the skin. Polyethylene liners will be purchased hereafter. (NASSD)

10. Solvent Used as Skin Cleaner. Use of a solvent labeled FSN WH 6850-264-9638 for cleaning the hands of a pipe shop employee resulted in a case of dermatitis. This material is Stoddard Solvent, Type 1, Petroleum Distillate, and is recognized as a primary irritant. The shop was advised to supply approved hand cleaners in this area. (CNSY)

11. Trichlorethylene. Thin film of degreasing solvent (trichloroethylene) present on large jet engine parts, was responsible for contact dermatitis of the hands of a mechanic in the handling of these parts. Protective skin creams and gloves were recommended. (NASQP)

12. Wood Resin Sensitization. A woodworker has developped sensitization to pine wood or resin over the past two years. Both hands and face are affected. His condition clears completely when he does not perform woodworking jobs. Patch tests for selective sensitivities are being conducted. (PoNSY)

13. "Zolatone" Interior Finish. A new type of interior finish ("Zolatone") applied by spraying has been adopted by the station for buildings and residences. Several painters have been found to be extremely sensitive to this material when patch tested. Work limitations are being issued for such individuals. As the material is used as a building wall finish, exhaust ventilation and other usual precautions for spray painting are not possible. (NOTS)

II. Noise, Illumination, Heat, Actinic Rays, and Other Environmental Physical Agents Which May Effect Employee Health and/or Efficiency

A. Noise

1. Air-Conditioning System in Auditorium. Excessive noise was reported in a military training auditorium where a new air-conditioning system had been installed. A noise analysis indicated no hearing hazard present. However, a considerable nuisance (communication under noise conditions) was found. To reduce the present overall sound pressure level of 69 db to a normal of 51 db at a distance of 5 feet from the speaking platform, it was recommended that the ventilation ductwork be acoustically treated. The Speech Interference Level Criteria Table 7.3 of the Industrial Noise Manual, published by the A.I.H.A. was used as a reference. (NASQP)

2. C-130 BL Aircraft, During Flight. A noise survey was conducted in flight of a Lockheed, 4 Engine Turbo-Prop C-130 BL aircraft (used in Antarctic operations), revealed a noise hazard present in the cargo compartment area. The survey was made after syncro-phasing of the blades was made with the following results in level-off positions of 13,000 feet:

Octave Bands	Cargo Compartment Sound Pressure Levels	Flight Deck Sound Pressure Levels
CPS	db	db
37.5 - 75	104	92
75 - 150	103	89
150 - 300	102	85
300 - 600	102	79
600 - 1200	101	76
1200 - 2400	102	67
2400 - 4800	103	64
4800 - 9600	102	63

Sound pressure levels were measured with different conditions present (in a climb, with blower on, with blower off), and it was found that they did not vary significantly. Adequate acoustical treatment was found in the flight deck. Personnel from the operating squadron were given audiograms and fitted with ear plugs. (NASQP)

3. Audiograms, Ordnancemen. Repeat audiograms have been given at monthly intervals to ordnancemen assigned to a guided missile static test shop where a hearing conservation program has been in effect for nearly a year. Total time exposure to noise has been reduced as much as practical and ear plugs are worn when the noise source (air turbines) are in operation. A substantial number of employees are known to have hearing deficiencies, but no current decrease in hearing acuity was detected by the repeated audiograms. The time

and history of the present hearing deficiencies are unknown as no pre-employment audiograms are available for most of the long-time employees of the station. (NOTS)

4. Boiler Shop. A noise survey in the Boiler Shop revealed noise levels as high as 116 decibels in the 2400/4800 cps range. Noise levels in each octave band between 300 and 4800 cps exceeded 95 decibels in each area of the shop with the exception of office spaces. The report of this survey re-emphasized the hearing conservation program in effect in this Shipyard. (CNSY)

5. Compensation Claims, Occupational Hearing Loss. Three compensation claims for occupational hearing loss were filed during the report period. One involved a leadingman boilermaker and the other a crane operator in the same shop. Past and present noise surveys in this shop together with octave band analyses reveal noise exposures exceeding presently accepted "damage risk criteria" by a considerable margin. A major portion of this shop has been designated as mandatory for the wearing of ear protective devices. The third claim involved a portal crane operator and the investigation of this latter case has not been completed. (PHNSY)

6. Ear Plugs. During fitting of ear plugs it was noted that none of the five sizes provided are adequate for fitting a small percentage of the workmen exposed to noise. On several occasions disposable ear plugs were dispensed. These are not always completely satisfactory. (SFNSY)

7. Hearing Loss Compensation Claims. An attempt is being made to collect data on compensation claims paid and filed for occupational medical conditions occurring in this Shipyard. During recent months, there have been three claims paid for loss of hearing. Two additional claims for loss of hearing have been filed. Noise surveys have been made as part of the investigation of these claims. There have been two claims paid for death due to carcinoma of the lung incident to asbestosis in pipe coverers and insulators and an additional claim has been filed. (PSNSY)

8. Lead, Use of in Noise Attenuation. A noise attenuation study was conducted in the Foundry using an improved sound barrier employing lead. The information was obtained from an article written in the Lead Industries Association Bulletin #A1A39. The use of layers of lead and plywood combined was very successful in reducing the overall noise level from a chipping hammer. The layers of lead and wood were obtained by using standby shields used in radiography. There is real merit in adopting the use of a high weight plus low rigidity type wall - a combination of lead and wood. (NNSY)

9. Muffler, Engine Test Stands. Noise levels were obtained in the area outside of the Diesel and Packard engine test stands. The purpose of the test was to evaluate the mufflers effectiveness in attenuating the noise in the area. It was determined that the mufflers did attenuate the noise to be acceptable level. When they became corroded their effectiveness was lost. Good maintenance is necessary to prevent the area from becoming a noise hazardous zone requiring continuous ear protection. (NNSY)

10. Power Plant. A survey was made of the Public Utilities Division power plant shops. The overall noise levels within the power plant building ranged from 95 to 108 decibels. Hearing protection was recommended. (NASSD)

11. Tinnitus, A3D Aircraft. An engineer worked for 10-15 minutes immediately under a J-57 engine pod on an A3D aircraft operating at fully military power. He was not wearing the required ear protective gear although the rest of the employees working in the area did wear the ear muffs. He developed tinnitus and some loss of hearing which became apparent soon after exposure but which was not reported to the Dispensary for two weeks. The audiogram obtained at that time showed a significant downward threshold shift from the previous test and the man complained of the continued "roaring in the head". He was sent for consultation to the Otolaryngology Clinic at U. S. Naval Hospital, Oakland where the diagnosis of "hearing loss and tinnitus" was made and the man was advised that this condition is very likely a permanent one. The employee was seen several times since but his condition has remained unchanged. It is estimated that his exposure was to noise of 135 to 145 decibels overall intensity. (NASA)

12. Torpedo Engine Test Cell Muffler. A beneficial suggestion involving the use of shop made mufflers on pressure relief vents of the fuel supply tanks of a torpedo engine test cell were evaluated with a sound level meter. Use of the muffler reduced the noise to a level where ear protection was not required. (NOTS)

13. Ventilation. A survey of the noise levels of solvent cleaning booths indicated that overall noise was 92 to 99 db. when fans only were running and 103 to 113 db. when both fans and air hoses were operating. It has been recommended that in view of reported plans for shop layout changes that these cleaning booths be located as far from personnel concentration as practical and installation of acoustical barriers to protect individuals at benches in nearby surrounding areas. Operators of the cleaning booths have been given audiometric tests and provided with hearing protection. (NASSD)

14. Ventilation System Noise; Duplicating Machine. Complaints were received that the ventilation system installed for the control of methanol vapor from duplicating machine operations caused excessive noise. Sound level measurements and octave band analyses were made in several locations in the duplicating machine room, with both the machines and ventilation operating, and with the ventilation alone operating. The overall levels were 70 to 72 decibels with machines and ventilation both operating, and 69 decibels with the ventilation alone being the source of noise. Calculation of speech interference levels indicated a normal voice could be used up to two to four feet. Accordingly, it was felt that reduction of sound levels in this room was not warranted from an economic or health standpoint. (PSNSY)

B. Illumination

1. Classrooms. Lighting in the Training Division classrooms ranged from 20 to 60 foot-candles; in the drafting room it was 90 to 110 foot-candles.

One-hundred and two-hundred foot-candles respectively were recommended. (NASSD)

2. Foundry. A light survey conducted in the foundry showed lighting at work levels to range from 2 to 20 foot candles throughout the shop. Inadequately illuminated areas were caused mainly by the poor condition of the light fixtures and reflectors rather than from the lack of light fixtures. It was recommended that proper maintenance and cleaning of existing fixtures be enhanced to obtain better light distribution. However, the need for additional lighting in the grinding room of the foundry was reported. (BNSY)

3. Light Fixtures, Height From Deck. Light fixtures, both fluorescent and incandescent, are frequently placed close to the surface of high ceiling shops and laboratories. Where clearance is not required for cranes, etc., lowering the fixtures to approximately 12 feet above the deck results in a noticeable increase in useful light at the work level, without additional fixtures of increase current consumption. (NOTS)

4. Reading Rooms and Mess Halls. An illumination survey of the reading and recreation rooms in the enlisted men's barracks revealed that in almost all locations there was insufficient lighting. In some of the reading rooms the illumination levels were as low as 5 foot candles. It was recommended that al least 30 foot candles of illumination be provided for these areas. Illumination surveys of the mess halls revealed that very low illumination levels were present in the food preparation areas and in the food serving areas. It was recommended that the illumination levels suggested by the American Society of Illumination Engineers for such areas be provided for the mess halls. (NASA)

C. Heat

1. IBM Machine Room. In response to complaints of discomfort from personnel in the machine accounting room, the Industrial Hygiene Division made a heat stress survey. Investigation was made on days when the outside temperature was high for this area. One series of measurements followed a period of three days of 80+ degree weather. During the investigation, a five-ton capacity air conditioner was installed for the purpose of keeping the IBM 1401 computer system cool. This had little effect on the results as a whole. Larger portable fans were also brought in during the investigation. Dry bulb temperature, wet bulb temperature, globe thermometer temperature, and air velocities were measured at points covering the entire area. From these data, the Belding and Hatch heat stress indices, maximum permissible exposure hours and relative humidity were calculated. The heat stress indices ranged from a low of 7 to a high of 27. From these data, the following conclusions were derived:

(1) The machine group air temperature exceeds the outdoor temperature by a few degrees.

(2) Humidity is within acceptable limits.

(3) Radiant heat is not a problem.

(4) Air movement is adequate.

(5) Conditions were very uniform throughout the machine room complex.

(6) There is no physiological limit to the duration of exposure to the heat stress in this area.

(7) The heat stress indices indicate, according to Belding and Hatch, a "mild to moderate heat stress. Where a job involves higher intellectual functions, dexterity, or alertness, subtle to substantial decrements in performance may be expected. Such decrements depend in large measure on individual variations in personnel". Under the observed conditions, it was considered that the heat stress in the machine group did not constitute a health hazard. (PSNSY)

2. A complaint was received concerning high temperature and humidity encountered during the replacement of batteries aboard a submarine. Subesequent inspection revealed the dry bulb temperature to be 86°F., the relative humitidy 66%, and the effective temperature 80°F. Considering the high rate of work involved in the manual labor being performed, it was recommended that more air movement be provided in the battery well through the use of portable blowers. (PHNSY)

D. Nonionizing Radiation

1. AN/SPG-55, AN/SPG-37, and AN/SPG-39 Radars. An R-F radiation survey was made aboard a ship to determine the extent of this hazard when operating the following radars; AN/SPG-55, AN/SPG-37, and AN/SPG-39 radars. The instrument used was the Electromagnetic Radiation detector manufactured by the Sperry Electronics Corporation. This instrument responds to all R-F energy over the band 200 mc. to 10,000 mc., regardless of the polarization. The only areas aboard considered to be hazardous to personnel are the 63 Director tube MK63 model 23. Readings of 20 milliwatts/cm^2 were obtained when Director 4 and Director 5 were on the following bearings:

Director 4 - 011° Train 0° elevation

Director 5 - 021° Train 5° elevation (PNSY)

2. "Flash Burn" from Welding Arc. A welder was hospitalized for 4 days for treatment of conjunctivitis of the eyes resulting from a "welding flash". He had been welding frames by means of the inert gas metal-arc process; two other welders were working close, sometimes within 6 feet. He was using a shade #12 lens in his hood and wearing 1.7 shades "flash" glasses. The cause of the flash was determined to be inadequate shielding between inert gas metal-arc welding operations. Ultra-violet radiation given off by this process is five to thirty times greater than that of conventional welding. The corrective recommended is diligent use of screens, curtains or shields. (PoNSY)

3. Radar Health Hazards Instruction. A station instruction is now in effect to furnish information concerning health hazards associated with

microwave incident to the operation of radar equipment, and to establish regulations for the protection of potentially exposed personnel. Neon lights (N.E. 51, Stock #G.F. 6240.233-9100) are used as practical safeguard indicators to avoid excessive exposure to microwaves. Eye examinations of exposed personnel are being conducted in accordance with BUMED INSTRUCTION 6260.1A dated 12 August 1961. (NASQP)

4. A study of the microwave radiation health hazard was conducted at the Guided Missile School on the two newer model radar transmitters.

Industrial Hygiene personnel recently visited the Guided Missile School at Dam Neck for the purpose of evaluating the health hazards associated with microwave and ionizing radiation incident to the operation of the AN/SPG-51 and AN/SPG-55 radar equipment being used for training purposes.

In the vicinity of the transmitter, klystron high voltage tube, of the AN/SPG-51 there was an insignificant amount of ionizing radiation. Film badges located near the potential x-ray source inside the panel indicated a 5 R cumulated exposure after two months. No radiation was detectable outside the panel or received by technicians working in the area. The radar beam located on the roof can be automatically or manually controlled. Using a Sperry Microwave Detector, intensities exceeding the maximum safe limit 10 mw/cm^2 were detected at distances up to 125 feet. The screen barrier at the observation point adequately protects the technican from the R.F. at the closer distance.

In the immediate vicinity of the transmitter, magnetron high voltage tubes, of the AN/SPG-55 there was a maximum ionizing radiation field of 30 mr/hr. However the average intensity at the usual working distance was negligible. Film badges worn by the technicians for one month did not reveal any exposure. When the radar beam is directed into the transmitter power room (A 225A), an energy of 5 - 12 mw/cm^2 is recorded. This position is acquired manually and with the "trigger kill" mechanism on. The openings in the screen mesh over the observation skylite is too large to attenuate the beam completely even though the direction of the radar beam into room can only be directed when special tests are conducted. On the roof at a distance of approximately 100 feet the microwave intensity is less than 10 mw/cm^2. Behind the screen observation position at distances less than 100 feet the intensity of the radar beam is less than the maximum safe limit. In classrooms within this estimated safe distance the radiation intensity is detectable outside the window. However, through the screen wire normally in place the intensity is completely eliminated.

Results of the study indicate the following:

Shielding located on the roof tops at the observation point for each of the radar beams tested are safe locations for the technicians to assume while the radar beam is energized.

No ionizing radiation hazard exists in the transmitter room.

Screens on the classroom windows within the safe distances from the AN/SPG-55 should be permanently secured or marked to indicate a "RAD HAZ AREA" exists outside.

The skylite on adjacent transmitter room of the AN/SPG-55 should have an additional layer of screen wire as a barrier against the beam when it is directed in the wrong direction. (NNSY)

III. Ionizing Radiation

1. Cobalt 60. After receiving a report from a nearby Naval Air Station that an electronic tube containing radioactive material had been accidently broken, instructions were issued for monitoring the area as a preliminary safeguard. No activity over background was found. In addition several fragments including a re-usable disc portion of the tube were placed into a sealed container and transported to the Industrial Hygiene Laboratory for further evaluation. Wipe tests revealed no activity from the fragments indicating that the portion of the tube containing the radioactivity had not been ruptured during the impact. (BNSY)

2. Plutonium - Beryllium. In response to a request by the Mound Laboratory, Monsanto Chemical Company, via BUSHIPS, the dimensional measurements of the plutonium-beryllium source assigned to the Radiac Facility were taken and the results submitted to the requesting laboratory. No deviation from the original measurements of the source was found. (BNSY)

3. Radium. A number of telephone switch boxes, rotary switch boxes and a telephone dial with luminous radioactive markers installed, were found stored in a shipyard shop during a routine survey. These had been recently removed from a carrier undergoing repair and overhaul. The luminous compounds were removed from the equipment by Shop 67 personnel and taken to the U. S. Naval Radiological Defense Laboratory disposal area for final disposition. (SFNSY)

4. Radium 226. At the request of Supply Department personnel, a package marked "radioactive", which was to be shipped to an outside naval establishment was monitored. The caution label stated the contents to be twenty four test samples, each with an intensity reading of 4 mr/hr. After the package was lined with tin foil and crated by Supply Department personnel, the exterior surface intensity was found to be 1.5 mr/hr. (BNSY)

5. Wipe Testing and Decontamination. During the past quarter a total of five hundred sixty six radiac sets were wipe tested. Of this number forty four were AN/PDR 18B sets which had been field changed and showed no presence of contamination. For many of these it was the second and third wipe test since the field change. Nine were 18B sets not field changed and required decontamination only at the window area. Activity counts of the removed sources were found to range from 219 to 40,011 counts per minute. Window wipe counts ranged from background to 17,297 counts per minute. The remaining instruments

consisted mostly of AN/PDR 27's and 18a's. Exterior wipes of this latter group revealed no activity above background. (BNSY)

6. The Area Operations Office of the Atomic Energy Commission inspected the radioisotope program conducted at this Shipyard under AEC licenses. This inspection included a discussion of the Shipyard's procedures for compliance with Title 10, parts 20, 30 and 31, and for compliance with the conditions set forth under each individual license and amendments. The inspection also included a physical observation of facilities and equipment for radioisotope use and storage. A thorough check of all records was made. The latter included those for radioisotope receipt, accountability, disposal, radiation surveys, leak tests and records of personnel exposure. (CNSY)

7. Radiation and contamination surveys were conducted routinely at various areas of the Shipyard. These areas include the Radiography Group of the Test Laboratory, the Radiac Repair Facility, the Electronics Planning Division, and the radioactive materials storage cage in the Supply Department. (CNSY)

8. The Industrial Hygiene Division assisted the Nuclear Power Division in radiological control aspects of several training programs being conducted in preparing personnel for operations involving work on nuclear powered submarines. (CNSY)

9. Five drums of radioactive waste were received in this Shipyard from a submarine tender. No unusual radiation levels were detected on any of the drums. The waste is being stored in a secured and suitably marked area until disposal can be effected by an AEC licensed contractor. (CNSY)

10. During this quarter the Industrial Hygiene Division leak tested all radioactive sources located in the Shipyard. This was in accordance with the requirements set forth by AEC. The results showed that removable contamination was well below the 0.005 microcuries limit. (CNSY)

11. Extensive gamma graphing is being performed during the conversion of the USS SPERRY to a nuclear submarine tender. The previous experience received on the conversion of the USS NEREUS has proved valuable. Metals Inspection personnel use the gamma graphing equipment within the recommended regulations but with less apprehension. They have had a few minor problems and have handled them without difficulty or over-exposure. Wipe test on the AEC sources have been within the allowable limit of .005 microcuries. (LBNSY)

12. One of the Non-Destructive Test personnel received a technical overexposure to iridium-192 while making exposures in a ship under construction. The controls for two sources were in the same room. One source was inadvertently reeled out for a short time while two men were placing the film. The source controls have now been clearly identified as the source concerned and existing instructions for locking the control when the source is retracted have been emphasized. Provisions of 10 CFR 20 and NAVMED P-5005 were followed. (MINSY)

IV. Substitution of Toxic Solvents by Less Toxic Materials

1. Toxic Material	Process	Substituted by
Carbona Cleaning Fluid (Carbon tetrachloride)	Cleaning of the silk screens in a Thremo-fax machine	Methyl chloroform (1,1,1 trichloro-ethane) (PHNSY)

2. A requisition for 55 gallons of tetrachloroethylene was forwarded to the Industrial Hygienist for approval. Investigation revealed the intended use was for cleaning typewriters. It was recommended that a much smaller quantity be issued and that 1,1,1 trichloroethane be substituted for the more toxic tetrachloroethylene. (CNSY)

V. Notes

A. General

1. All requisitions made to this Shipyard's supply system for potentially toxic materials must be approved by the Industrial Hygiene Division prior to issue. Thirty-four requisitions were processed during this quarter, ten of which were not recommended for issue because of their toxic properties. (CNSY)

2. Industrial Hygiene information sheets have been issued on: "Prevention of Dermatitis from Epoxy Resins"; "Industrial Respirator Chart"; and "Labeling of Hazardous Chemicals". (PoNSY)

3. The Industrial Hygiene Division has prepared a "Sealed Source Data Sheet" for distribution to each Shipyard activity which is a holder of an AEC license. Distribution was also made to the Radioisotope Committee and to the Shipyard Duty Officer for information to be used in case of emergencies. The information includes the radioisotope, nominal activity, serial number, exact location, date of receipt, assay date, present activity, AEC license, license expiration date, date of last leak test, and contamination level in microcuries. The data given will be made current at intervals of three months. (CNSY)

B. Industrial Hygiene Services Accomplished at Request of Other Commands

1. Mr. Harry Utes, Senior Industrial Hygienist of the NAS Medical Department, conducted a comprehensive industrial hygiene survey at Naval Air Facility, Litchfield Park, Arizona. Recommendations were made regarding precautions to be observed in the use of epoxy resin components; a louvered barrier to restrict the drift of mist during the stripping of aircraft with Turco Cleaner (Mil-R-8633A); a photodosimetry program; and a labeling committee to review safety factors to be observed in the handling of chemicals. (NASSD)

2. Mr. Alex Munton, Head Industrial Hygiene Division of the Shipyard Medical Department, conducted an industrial hygiene survey at USNAS, Brunswick, Maine. (PoNSY)

3. Mr. William T. Marr conducted an industrial hygiene survey at the U. S. Naval Air Station, Los Alamitos. (LBNSY)

4. Mr. Paul Cuykendall conducted an industrial hygiene survey at the Marine Supply Center, Barstow, California. (NOTS)

5. Mr. Ronald Byrd conducted an industrial hygiene survey of the Naval Ordnance Plant, Macon, Georgia, and a noise survey of the Marine Corps Supply Center, Albany, Georgia. (NASJ)

6. The Industrial Hygienists of the Shipyard Medical Department conducted a comprehensive industrial hygiene survey of the U. S. Naval Supply Center, Bayonne, N.J. (NYNSY)

7. Mr. Oscar Sobol conducted an industrial hygiene survey of the Naval Supply Depot, Clearfield, Utah. (NASA)

8. Cdr. R. E. Nebelung, MSC, USNR, Industrial Hygiene Officer on the Medical Department staff of the Naval Air Station, conducted a survey of NAD, McAlester, Oklahoma. (NASP)

C. Lectures and Other Educational and Training Activities of Navy Industrial Hygienists

1. The Industrial Hygiene Division of the Shipyard Medical Department provided a display of industrial hygiene equipment for Armed Forces Day. Handout material outlining the scope of the industrial health program was distributed to visitors of the exhibit. Plastic display cases were used to allow "visitor operation" of Radiation survey instruments, Gamma Alarm, and Mercury in air detection equipment. Approximately 500 persons visited the booth. (PoNSY)

2. Mr. Sal DiLustro, Senior Industrial Hygienist of the Naval Air Station Medical Department, participated in the Fourth Annual Institute sponsored by the University of Rhode Island as chairman of the Industrial Hygiene Seminar.

b. A lecture on the Station's Industrial Health Program to the new supervisors was given by the Industrial Medical Officer and the Industrial Hygienist. (NASQP)

3. Mr. William T. Marr was on 15 days active duty with the Air Force Reserve. During this tour of duty, he attended a Research and Development Symposium concerned mostly with our Armed Forces rocket, missile, and space activities. (LBNSY)

4. Mr. Harry Gilbert delivered a paper "Ultramicrodetermination of Mercury in Blood" at the American Industrial Hygiene Conference, Detroit, Michigan. (NYNSY)

5. The Industrial Hygienists prepared a nine hour training course on "Principle of Radiation and Contamination Control". This was presented to thirty hospital corpsmen and Chiefs attached to the Medical Department in order that they be prepared for Disaster Control and emergencies arising from any radiological incidents. (CNSY)

6. Mr. Jack McElhiney was elected Secretary-Tresurer of the Northern California Section of the American Industrial Hygiene Association. (SFNSY)

7. Mr. Jack McElhiney attended the Health Physics Society meeting at Las Vegas, Nevada, June 11 - 16 1961. (SFNSY)

8. Mr. Paul Cuykendall lectured on Industrial Hygiene and Industrial Health at the sessions of the Safety Training Courses for Division Heads and first level supervisors of the Propellant Development Laboratories and Pilot Plants.

Lectures on Heat Stress and its Control were given this spring at monthly safety meetings in the shops of the Public Works Department, and to groups of ordnancemen. (NOTS)

9. Victor Kindsvatter, D.Sc., gave a lecture on the hazards to be anticipated in the Outside Machine Shop. All of the line supervision in this shop were given this lecture and they in turn passed the information on at Standup Safety Meetings with their men. (PHNSY)

10. A report entitled "Environmental Radioactivity Levels at Portsmouth Naval Shipyard, Feb 1961" summarizes the findings of the Industrial Hygiene Division for the four years to date that this program has been in effect. Sampling of river water, air, and other environments related to the Shipyard began seventeen months before any nuclear submarine became operational to determine what was normal to the area. It was continued since then to protect the shipyard and the community by assuring control of radioactive materials and work, and to demonstrate the effectiveness of such control measures. (PoNSY)

* Abbreviation in parenthesis listed throughout this Report refer to the following stations:

Naval Shipyard, San Francisco	SFNSY
Naval Shipyard, Mare Island	MINSY
Naval Shipyard, Long Beach	LBNSY
Naval Shipyard, Bremerton	PSNSY
Naval Shipyard, Boston	BNSY
Naval Shipyard, Portsmouth, N.H.	PoNSY
Naval Shipyard, New York	NYNSY
Naval Shipyard, Charleston	CNSY
Naval Shipyard, Philadelphia	PNSY
Naval Shipyard, Norfolk	NNSY
Naval Shipyard, Pearl Harbor	PHNSY
Naval Air Station, Alameda	NASA
Naval Air Station, San Diego	NASSD
Naval Air Station, Norfolk	NASN
Naval Air Station, Pensacola	NASP
Naval Air Station, Jacksonville	NASJ
Naval Air Station, Quonset Point	NASQP
Naval Weapons Plant, Washington, D. C.	NWP
Naval Ammunition Depot, Crane	NAD
Naval Supply Center, Oakland	NSC
Naval Ordnance Test Station, China Lake	NOTS

INDEX TO "OCCUPATIONAL HEALTH HAZARDS"

Release No. 29

EXHIBIT D

EXHIBIT D

INDUSTRIAL HYGIENE AND THE NAVY IN NATIONAL DEFENSE

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NEW YORK

One of the most important concerns of the Medical Department of the United States Navy today is industrial hygiene, especially in navy yard practice. This is a situation of ever increasing moment in view of the present era of enormous expansion in naval construction, unparalleled in the history of the United States. This is bringing about a vast increase in the industrial force of the navy yards, and in all probability new problems in industrial hygiene will emerge incident to new materials and processes.

It should be remembered in this connection that the policy of the Navy Department is to allot new naval construction on an equal basis to government and commercial yards. It follows that the commercial establishments are also undergoing rapid development, with an enormous rise in industrial personnel. They will therefore be confronted with problems of industrial hygiene similar to many of those arising in navy yards.

Industrial hygiene is a field which is now undergoing rapid development. This appears to be due to certain significant trends, the most important of which has been the recent setting up of many industrial hygiene units in state or city departments of health through funds released by the passage of the Social Security Act. These trends, in fact, particularly that just mentioned, reflect a definite renaissance of industrial hygiene as a phase of public health in the United States.

This movement is receiving increasing recognition in naval industrial circles, and industrial hygiene is now listed as a specialty of the naval medical officer along with other specialties outside the purely clinical fields, such as aviation medicine, submarine medicine and chemical warfare medicine.

Those just mentioned, however, are concerned primarily with naval personnel. Industrial hygiene, on the other hand, is largely occupied with federal industrial personnel. It therefore follows that the status of the senior medical officer of a major navy yard in relation to the industrial

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department is analogous in many respects to that of the medical director of a large commercial industrial plant. The object of this paper is to present an outline of the administration of industrial hygiene in navy yards, which are the chief industrial units of the Navy.

Mention should be made in this connection of the Subcommittee on Industrial Medicine of the Health and Medical Committee of the National Defense Council. The Surgeon General of the Navy is a member of the latter committee and is represented by two liaison naval medical officers in conjunction with the Subcommittee on Industrial Medicine. Important recommendations pertinent to the Navy and industrial health will result, and many of them undoubtedly will be put into effect.

The term industrial hygiene as applied in the present discussion is used in the specific sense of the prevention and control of occupational disease. The fact may be of interest that the first compensation law for occupational diseases in this country was one passed in 1908 by Congress for United States civil service employees. Compensation laws for industrial diseases have lagged far behind legislation covering accidents. Only sixteen states of the Union provided compensation for one or more occupational diseases up to the year 1937, although all but two provided legislation for accidental injuries.

INDUSTRIAL ORGANIZATION OF NAVY YARDS

The mission of a navy yard is primarily the construction, maintenance and repair of naval vessels. The central administration of navy yards and, in fact, of all industrial shore stations of the Navy is vested in the Assistant Secretary of the Navy, in whose office is the Shore Establishments Division of the Navy Department.

There are eleven navy yards, located as follows: Portsmouth, N. H.; Boston; New York; Philadelphia; Washington, D. C.; Norfolk, Va.; Charleston, S. C.; Mare Island, Calif.; Puget Sound, Wash.; Territory of Pearl Harbor, Territory of Hawaii; and Cavite, Philippine Islands.

In addition, mention should be made of the following specialized industrial plants: the plants for the building of submarines at Portsmouth, N. H., and Mare Island, Calif.; the Naval Gun Factory at the Navy Yard, Washington, D. C., for the production of high caliber naval guns, torpedo tubes and accessories; the torpedo factories at Newport, R. I., and Alexandria, Va., for the manufacture of torpedoes; the powder plant at Indian Head, Md., for the production of Navy smokeless powder; the aircraft factory at Philadelphia for experimental air craft construction and repair; the naval armor plate plant at Charleston, W. Va.; and the Naval Clothing Factory at Brooklyn.

Organization of the New York Navy Yard.—The New York Navy Yard may be taken as typical of a major yard. Its organization falls under two departments, i, e., the industrial department, headed by a naval captain of the engineering branch, and an operations or military department, under the direction of a naval line captain. As a conservative estimate it may be stated that 90 per cent of the activities of a navy yard are industrial.

Under the industrial manager there are at present twenty-three shops of different types, with a force per shop varying from 30 to 3,200 men. The total number of civil employees of this yard is now approximately 17,000. This is rapidly rising and, it is estimated, will exceed 20,000 in 1941.

EXTENT OF THE CIVILIAN INDUSTRIAL FORCE OF THE NAVY

The combined industrial force of all navy yards is now approximately 130,000. In view of the pending program of naval construction it is estimated that this number will reach 150,000 in 1941. If made inclusive of all shore stations it will probably be close to 180,000.

In addition to the industrial force of navy yards, one must consider the employee volume in the commercial naval ship-building plants, such as the Newport News and Dry Dock Company, the New York Shipbuilding Corporation at Camden, N. J., and the Bethlehem concern at Quincy, Mass., which now employ from 12,000 to 15,000 men each. It is a conservative estimate that the combined industrial personnel of all such plants on both the east and the west coast will reach a peak of over 100,000.

ORGANIZATION OF THE MEDICAL DEPARTMENT OF A NAVY YARD

The medical staff of the New York Yard consists of ten medical officers, five dental officers, one nurse, forty-five enlisted men and two civilian clerks. The chief activities with reference to industrial personnel may be summarized as follows:

(*a*) Preemployment physical examinations. All applicants for federal jobs are examined physically, although the standards for acceptance vary to some extent for different occupations.

(*b*) Periodic physical examinations. These, of course, are conducted with the object of medical supervision of certain groups of employees exposed to definite potential health hazards, such as foundrymen and spray painters.

(*c*) Physical examination of federal employees for retirement. This is for evaluation of the degree of disability and opinion as to disposition when total disability is alleged.

(*d*) Diagnosis, treatment and disposition of industrial injuries and occupational diseases.

(*e*) Administration of compensation cases. (*f*) Industrial hygiene and plant sanitation.

THE INDUSTRIAL MEDICAL OFFICER

An officer of the medical staff of the navy yard is specifically detailed for industrial hygiene administration subject to the direction of the senior medical officer. Figure 1 outlines the scope of his activities.

(*a*) Advice to the safety engineer. The adequate practice of industrial hygiene in navy yards, as in civil industry, is dependent on the close and efficient correlation of the work of the safety engineer and that of the industrial medical officer. It is essential to obtain a grasp of the functions of both officers in order properly to visualize industrial hygiene administration.

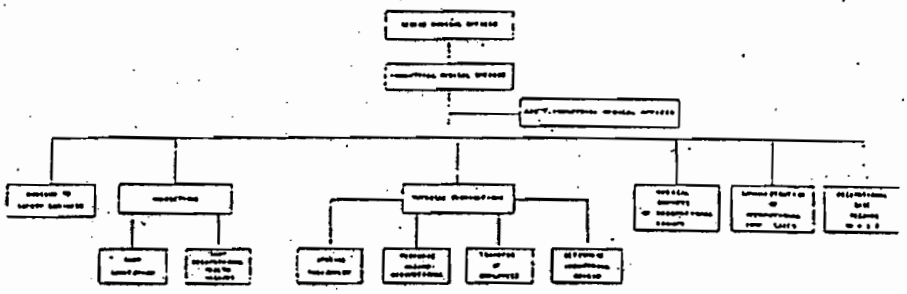

Fig. 1.—Organization for administration of industrial hygiene in navy yards.

(*b*) Inspection. The industrial medical officer is responsible for the general supervision of plant sanitation, i. e., ventilation, illumination, water supply, general cleanliness and adequacy and condition of sanitary facilities. He also conducts shop inspections for occupational health hazards and measures for their control. He cannot expect to evaluate working conditions and thereby detect occupational health hazards early unless he makes periodic inspections through the plant. In this way he can observe the adequacy of existing measures against specific hazards and decide whether such methods are being properly utilized. These inspections also have a psychologic value, in that they create greater respect for the medical service in the minds of the employees.

(*c*) Supervision of special physical examinations. This includes handling of preemployment cases when the applicant reports previous exposure to potential industrial health hazards, such as lead fumes or foundry dust; periodic examinations of groups exposed to such potential occupational hazards, e. g., spray painters and sandblasters; examination

of persons referred for transfer to other shops where there is a question of occupational disability, and clinical studies for a decision as to industrial origin of obscure disabilities. (*d*) Medical surveys of occupational groups.—This will be discussed later. (*e*) Administration of the medical aspects of claims for compensation for occupational disease pending before the United States Employees' Compensation Commission. (f) Supervision of preparation of accident and occupational disease reports for the Navy Department.

THE SAFETY ENGINEER

A civilian safety engineer is stationed at the Navy Department as the adviser to the head of the Shore Establishments Division. A naval officer is assigned to each navy yard as the safety engineer.

1. Accident and Unsafe Practice Control.—Safety engineering is one of the divisions of the navy yard organizations. The safety engineer conducts an investigation of all lost time accidents with a view to fixing the cause and advising measures to prevent their recurrence. The basic features of approach to the safety problem in navy yards are provision of safety devices, such as mechanical guarding, and the safety education of workmen and their supervisors.

Another important aspect is the competitive approach, which has proved effective in stimulating interest in accident prevention. The Navy Department publishes the comparative safety scores of all navy yards monthly.

Figure 2 emphasizes the advance made by the Navy Department in accident reduction, beginning with an intensive safety campaign in navy yards in 1926. The period covered is from 1926 to 1937 inclusive. The accident rate was lowered from 20 to practically 10 per year in a twelve year period; the severity rate reduced from 2.2 per year to 0.5. On the other hand, it will be noted that the total man hours worked during the period increased to 115 million from 65 million per year, the average number of employees rising from approximately 30,000 to 66,000.

2. Occupational Health Control.—The control of occupational disease in navy yards naturally lies within the sphere of both the safety engineer and the industrial medical officer. Although the safety engineer is administratively charged with this task, the medical officer is actually coordinate with him in this phase.

As a matter of fact, the medical officer is the key man in the prevention of industrial disease in navy yards, in that he usually discovers its existence. The diagnosis having been made, the occupational history and the preemployment examination record are carefully reviewed in order to reach a decision, if possible, whether the hazard can be traced

to present or past employment. If it is ascribed to or aggravated by environmental conditions, the medical officer confers with the safety engineer, and an industrial hygiene survey is usually recommended to the commandant.

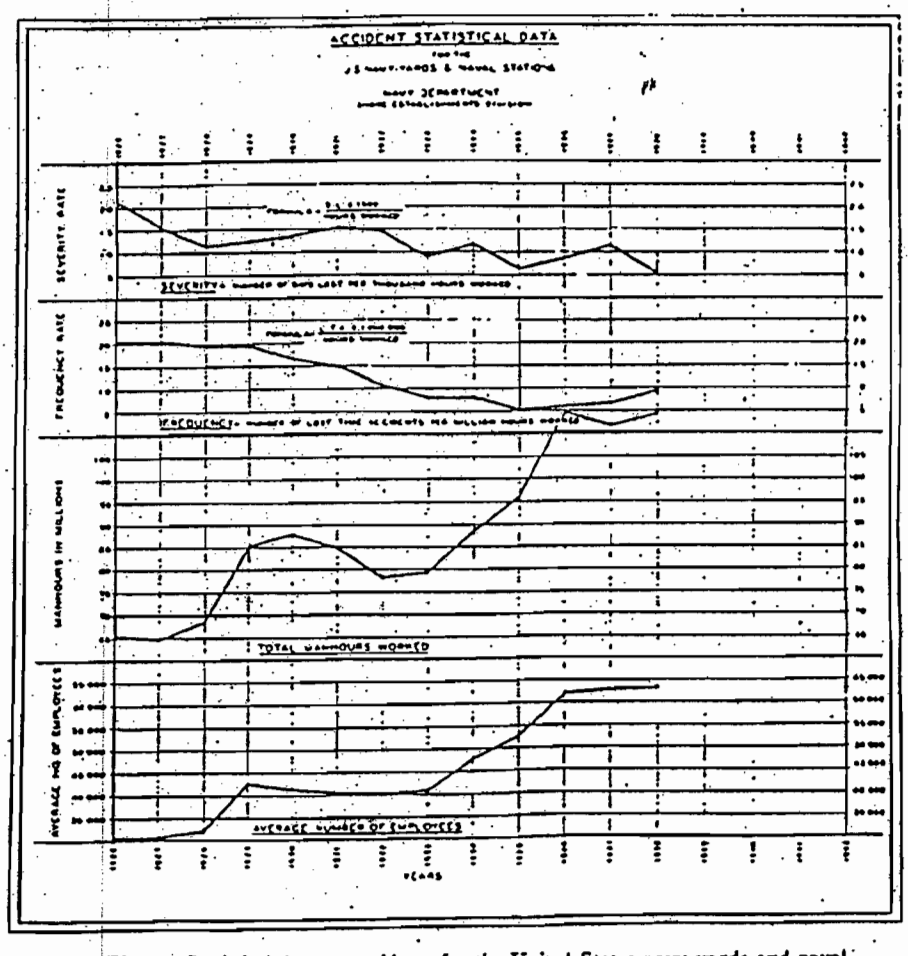

Fig. 2.—Statistical data on accidents for the United States navy yards and naval stations.

THE INDUSTRIAL HYGIENE SURVEY

An industrial hygiene survey is of course a combined medical and engineering task.

1. The Medical Survey.—This consists of a complete clinical study, with detailed occupational histories of all exposed personnel as a case-finding procedure under the supervision of the industrial medical officer.

Although not directly responsible beyond the medical survey, it is important that the medical officer have a reasonable grasp of the entire problem so that he will be in a position to utilize all data that have any bearing on the interpretation of his medical findings. In addition, he may act in an adivsory capacity to the safety engineer with respect to certain technical phases in the planning and conduct of the engineering aspects of the survey.

2. *The Engineering Survey.*—The engineering phases of an industrial hygiene survey in a navy yard fall, naturally, under the direction of the safety engineer. As in a commercial industry, this embraces essentially a complete story of the occupational duties, the physical conditions of work, and the materials, processes and equipment of the individual shop; in other words, the environmental conditions.

Laboratory facilities: No facilities are provided for technical studies in the navy yard organization, and there is no central laboratory unit in Washington which could supply industrial hygienists for field studies. This is an urgent need, and recommendations have recently been made to the end of setting up such an agency.

The Navy Department has been most fortunate in the past in securing the services of the Division of Industrial Hygiene of the United States Public Health Service to conduct such technical studies, much in the same way that industries in the states utilize the facilities of state bureaus of industrial hygiene.

The safety engineer formulates the control program of the health hazard on the basis of the data obtained in the survey. After all, once the cause is disclosed, prevention of occupational disease is largely an engineering problem.

THE REPORTING OF INDUSTRIAL ACCIDENTS AND ILLNESS

An important advance in accident prevention by the Navy was initiated on July 1, 1940, when the Secretary directed that a report of each accident and illness, both "lost time" and "no lost time," occurring among civil personnel of navy shore establishments be made to the Bureau of Medicine and Surgery. The report of each accident is submitted on a form, known as form F-C (fig. 3). This presents the diagnosis of the injury and the essential details as to the cause. Punch cards are made up from these records for mechanical tabulating and indexing through a sorting machine. This provides facilities for the statistical analysis of these accidents and diseases, and the data obtained promise to be a far reaching contribution to the subject of accident control. Prior to use of this system a crude system of accident reporting to the department was in effect, but it was not adapted to statistical analysis.

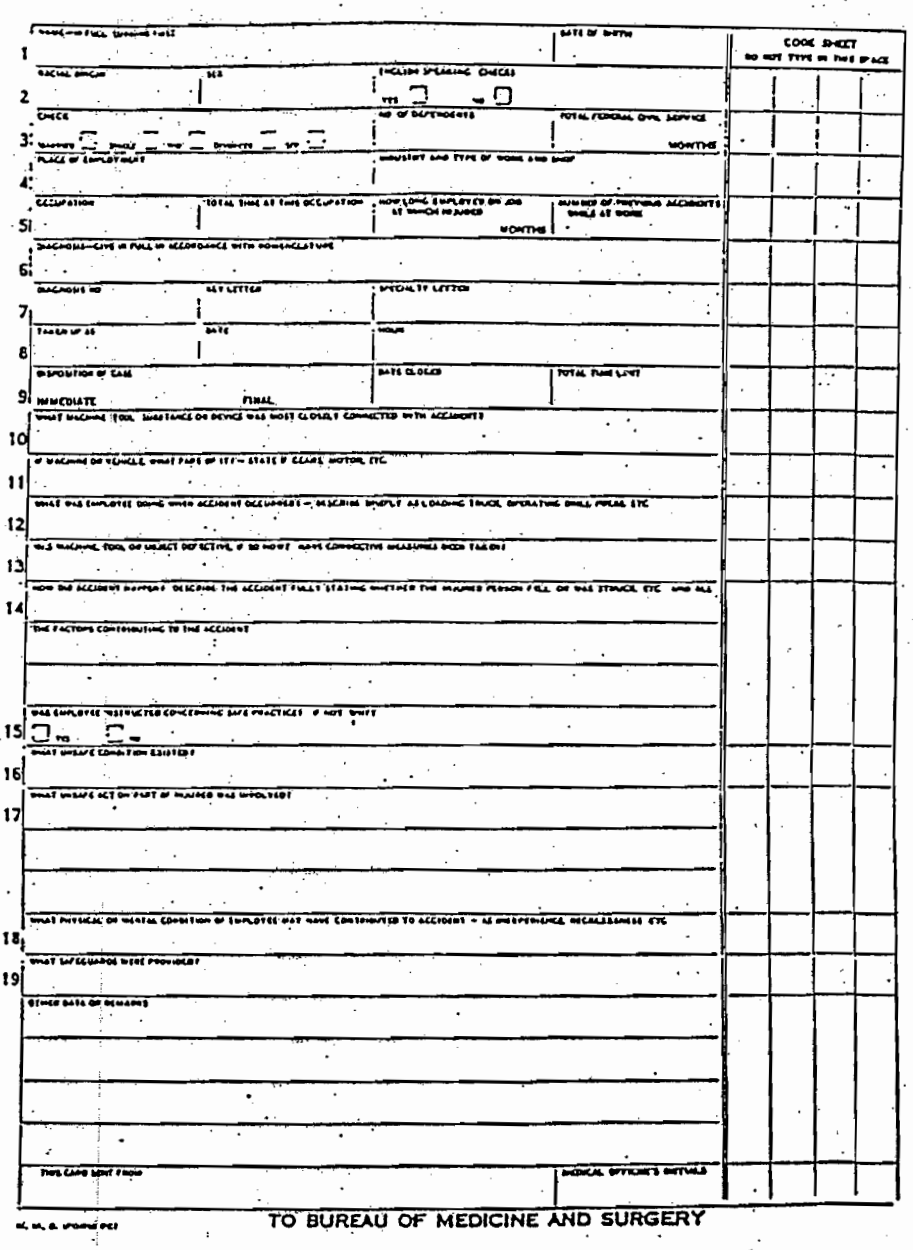

Fig. 3.—Form for report of industrial disability.

OCCUPATIONAL HEALTH HAZARDS IN NAVY YARDS

The chief potential occupational health hazards in navy yards will now be considered as indicated in the accompanying table. The data are based chiefly on reports to the United States Employees' Compensation Commission over a series of years. It hardly requires emphasis that industrial medical officers must be constantly on the alert for new health hazards.

Occupational Health Hazards in United States Navy Yards

1. Dust Diseases
   (a) Silicosis: foundry workers and sandblasters.
   (b) Asbestosis: makers of pipe insulating covers
2. Diseases Due to Lead and Lead Compounds
   (a) Spray lead painters
   (b) Brush lead painters
   (c) Lead putty workers
   (d) Oxyacetylene welders: cutting and scrapping of ships
   (e) Handlers of molten lead: preparation of Babbitt metal and lead coating of metals
   (f) Handlers of lead azide: used in pulverized form as a detonator in naval munitions
3. Diseases Due to Volatile Organic Solvents
   (a) Lacquer spray painting
   (b) Degreasing of machinery: benzene, toluene, xylene, trichlorethylene, higher alcohols, etc.
4. Diseases Due to Roentgen Rays and Radium
5. Diseases Due to Welding
   (a) Nitrous gases
   (b) Metallic oxides, of potentially toxic nature: manganese, lead, fluorides, silicon, zinc, etc.
   (c) Zinc fume fever
   (d) Eye hazards: actinic ophthalmia chiefly
6. Chromate Poisoning: electric platers
7. Diseases Due to Ingestion of Radium: painters of luminous dials of instruments
8. Injuries from Nitro Explosives: workers in high explosives, such as T. N. T. and tetryl (tetranitromethylaniline)
9. Diseases Due to Metallic Dust
   (a) Excessive pulmonary fibrosis: grinders, buffers and polishers; carborundum, alundum, etc.
10. Dermatoses: Machine operators from contact with cutting and soluble oils
11. Diseases Due to Excessive Heat: heat cramps, heat exhaustion and heat stroke
12. Caisson Disease: diving operations
13. Functional Disturbances
   (a) Anoxemia: from entering confined spaces
   (b) Phosgene poisoning: from carbon tetrachloride used to extinguish fires in confined spaces
   (c) Carbon monoxide poisoning: incident to oil fires in confined spaces

1. Dust Diseases.—(*a*) Silicosis: Important units of all navy yards are iron, steel and brass foundries. The dust control problem is a major concern in these plants as in civil industry.

One of the difficulties met with in combating the foundry dust problem in navy yards is the fact that silica (silicon dioxide) dust is not particularly irritating or obnoxious in concentrations which may ultimately lead to pulmonary damage. As a result there is a tendency to an indifference on the part of the workers and even of the supervisors and executives which must be overcome in order to accomplish effective and permanent dust control. Another reason for this attitude is the long period necessary for silicosis to develop in foundry workers exposed to only moderate concentrations of dust, such as molders.

A medical survey of the foundries of the Navy Yard, Washington, D. C., was conducted by me in 1939. Of 525 men subjected to roentgen examination, approximately 60 per cent had a record of ten years or over and 36 per cent a record of twenty years or over of total foundry employment. Silicosis was found in 12, or 2.4 per cent of the total—in all of them in stage 1 or 2; these data led to recommendations for improved methods of dust control.

Industrial hygiene surveys in foundries other than the Washington Navy Yard have not as yet been carried out but would in all probability disclose a certain incidence of silicosis, even if not of the disabling type. The medical control of silicosis in the naval establishment consists of roentgen examination of the chest before employment and an annual roentgenogram of every man exposed to the higher silica dust concentrations, such as sandblasters and shake-out men.

(*b*) Asbestosis: This is a potential occupation disease hazard due to inhalation of asbestos dust among workers engaged in the manufacture of asbestos insulating covers for flanges, valves and high temperature steam turbines.

I recently conducted a medical survey of the workers of the pipe-insulating shop of the New York Navy Yard, inclusive of roentgen studies. The maximum working period of exposure was seventeen years. No cases of asbestosis were found. Similar findings have been reported from two other yards, but the study should be extended to all men in this trade.

Medical control consists of taking a roentgenogram of the lungs annually. The material is moistened, and localized exhaust ventilation is installed over the work area. A respirator is worn during the dustiest aspect of the process.

2. Diseases Due to Lead and Lead Compounds.—Lead poisoning has become comparatively infrequent in recent years both among industrial and among service naval personnel. This is apparently due partly to changes in materials and methods and partly to improved measures of control. Zinc and titanium paints have largely replaced leaded material for ship interiors. Red lead paint is still in use as the priming coat on hull exteriors, but the finishing coats contain either no lead or a greatly reduced proportion. All painters regularly handling lead-containing paint are examined semiannually for evidences of lead absorption.

3. Diseases Due to Volatile Organic Solvents.—Lacquer spray painting is done on an extensive scale in navy yards and therefore demands rigid medical supervision. Another important application is in degreasing measures. All spray lacquer personnel are subject to semiannual physical examination.

4. Diseases Due to Roentgen and Radium Hazards.—Radium and roentgen rays are continually utilized for the detection of flaws in castings

and pipe-welded joints for high pressure steam installations. Radium has an advantage in the small size of the equipment in that it is adapted to tests in the confined machinery spaces of ships.

The question of protection from irradiation of the operating and other personnel working in the vicinity of the apparatus has received thorough study, the practice of the Bureau of Standards being generally followed. Complete blood counts of all technicians are conducted quarterly, and special preemployment examinations are prescribed.

Another potential hazard of radium is that of ingestion incident to radium painting of luminous dials, especially for fire control instruments and aircraft. The control measures advised by the Public Health Service are generally in force plus certain local regulations.

5. Diseases Due to Welding.—The hygienic supervision of welders is another outstanding feature of medical responsibility. Approximately 2,500 welders were on the rolls of the combined shore establishments as of Jan. 1, 1940, including 653 at New York. This number has progressively increased and will continue to rise.

The immense volume of work in confined spaces is characteristic of naval welding. A battleship of 35,000 tons displacement under construction contains approximately 500 compartments in which electric welding is mandatory; certain of these spaces are extremely small and force the welder to work in very cramped positions. These conditions complicate the question of effective preventive control of the hazards.

The chief hazards which have to be considered at present are "nitrous fume" poisoning, zinc fume fever, as it is popularly termed, and actinic opthalmia from ultraviolet irradiation of the welding arc. "Nitrous fume" poisoning, while comparatively rare, is a serious condition. No emphasis need be placed on the fact that these injuries would be still further reduced in number if the control measures provided were properly utilized.

It may be of interest to note that in 392 cases of actinic ophthalmia reported at the New York yard in the first ten months of 1940, only 30 per cent of the patients were welders, apprentice welders, helper welders and tack welders; the remaining 70 per cent were men exposed in spaces adjacent to the welding arc or assisting in welding operations but not utilizing available protective goggles.

Chronic poisoning among naval welders from manganese, fluorides or silicon, which might be ascribed to inhalation of these metallic or mineral oxides in the welding fumes originating in the rod coatings, has not been reported. The possibility of such poisoning, of course, cannot be denied.

Limitation of space prevents mention of additional occupational health hazards.

ANNUAL EXAMINATIONS OF CRANE OPERATORS, ENGINE MEN (HOISTING AND PORTABLE) AND LOCOMOTIVE ENGINEERS

These classes of workers are physically examined annually, with special emphasis on blood pressure, hearing and vision. In view of the nature of their duties, physical failure, such as sudden collapse, might involve critical injury to themselves and others and, in addition, damage to material. If corrective measures are impracticable the worker is retired or transferred to some suitable type of employment. A crane operator, for instance, presenting marked hypertension would be referred to his private physician and transferred to other duties.

LOSS OF TIME FROM INDUSTRIAL VERSUS NONINDUSTRIAL DISABILITIES

In a limited study of 116 industrial companies in various parts of the United States conducted by the American College of Surgeons a few years ago, it was found that the loss of time from nonindustrial types of illness was approximately fifteen times that industrially connected. In my capacity as senior medical officer of the Washington Navy Yard I made the following observations for the calendar year 1938: total industrial force, 7,000; average number of days lost from industrial accidents 0.14, and average number of days lost from nonindustrial illness or accident, 5.20. The time lost from nonindustrial disability was therefore thirty-seven times that lost from industrial causes. A similar study made by me at the New York Navy Yard for 1939 revealed that the time lost from industrial causes was roughly four times that from nonindustrial causes. The possible factors in the difference between the two yards have not been analyzed.

Disparities of the same general order have been reported in recent statistical studies by certain large commercial industries and reflect an enormous economic loss. Much of this nonindustrial illness is preventable. It is believed that in the naval establishments this wastage due to preventable illness can be greatly reduced if the problem is attacked by an annual physical examination of all employees, men requiring corrective treatment being referred to their private physicians or to other agencies. This would require a heavy increase in medical staffs, but it would be a profitable investment by naval industry in the saving of man power for national defense. It is a question worthy of being explored.

EXHIBIT E

EXHIBIT E

UNITED STATES DISTRICT COURT
DISTRICT OF CONNECTICUT

DAVID H. FORTIER and GAIL FORTIER,	:	
Plaintiffs,	:	
v.	:	3:07-cv-00005 (WWE)
AMPCO-PITTSBURGH CORP., individually BUFFALO AIR HANDLING, individually and as successor to Buffalo Forge Co., BUFFALO PUMPS, INC., FOSTER WHEELER L.L.C. (survivor to a merger with Foster Wheeler Corporation) GENERAL ELECTRIC COMPANY, PHELPS DODGE INDUSTRIES, INC.[1], VIAD CORP., f/k/a The Dial Corporation, individually and as successor in interest to Griscom Russell Company, Defendants.	:	consolidated with: 3:07-cv-00014 3:07-cv-00019

RULING ON MOTION TO REMAND

This action arises from plaintiffs David H. Fortier and Gail Fortier's claims that defendants AMPCO-Pittsburgh Corp., Buffalo Air Handling, Buffalo Pumps, Inc., Foster Wheeler L.L.C., General Electric Company and Viad Corp. ("defendants") supplied or manufactured asbestos or asbestos-containing products that injured David Fortier ("Fortier") during his service as a machinist's mate in the United States Navy from 1968 to 1972. Plaintiffs assert that this exposure to asbestos caused him to contract malignant mesothelioma, the diagnosis of which was rendered on October 5, 2006. Mesothelioma is a fatal disease for which asbestos exposure is the only known cause.

[1]Defendant Phelps Dodge Industries, Inc. was dismissed by stipulation dated February 1, 2007 [Doc. #24].

BACKGROUND

On November 28, 2006, plaintiffs filed an asbestos personal injury action in the Connecticut Superior Court, Judicial District of Fairfield at Bridgeport against over 130 defendants, alleging that Fortier was injured as a result of exposure to asbestos while working in Connecticut as a machinist's mate in the Navy during the years 1968 to1972. On December 1, 2006, plaintiffs filed a second action in the same state court against the seven defendants originally parties to the instant matter (No. 06-5005848-S).[2] In January 2007, defendants removed this case to federal court pursuant to the Federal Officer Removal statute, codified at 28 U.S.C. § 1442, which permits removal of state actions brought against an officer or agency of the United States, or an individual acting under the auspices of a federal officer.[3] 28 U.S.C. § 1442(a)(1).[4] Mesa v. California, 489 U.S. 121, 125, 109 S.Ct. 959, 103 L.Ed.2d 99 (1989). Plaintiffs now move to remand this case to state court, arguing that this Court lacks subject matter jurisdiction over their claim of failure to warn.

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[2]The original seven defendants included Phelps Dodge, which, as stated above, has since been dismissed.

[3]These cases were docketed in federal court as 3:07-cv-00005, 3:07-cv-00014 and 3:07-cv-00019. They were transferred to this Court and have been consolidated for the purpose of this motion. Fortier v. AMPCO-Pittsburgh Corp., et al., 3:07-cv-00005.

[4]28 U.S.C. § 1442(a) provides in relevant part: "A civil action or criminal prosecution commenced in a State court against any of the following persons may be removed by them to the district court of the United States for the district and division embracing the place wherein it is pending: . . .1) Any officer of the United States or any agency thereof, or person acting under him, for any act under color of such office or on account of any right, title or authority claimed under any Act of Congress for the apprehension or punishment of criminals or the collection of the revenue. . . ."

DISCUSSION

A party may remove a case from state court to federal court only if the action is one over which the federal court has jurisdiction. 28 U.S.C. § 1441(a). In order to demonstrate that removal is proper, the movant bears the burden of showing the existence of federal jurisdiction. The rules regarding removal are strictly construed. In re: Methyl Tertiary Butyl Ether Products Liability Litigation, 342 F.Supp.2d 147, 151 (S.D.N.Y. 2004).

Removal is proper if a state law claim is completely preempted by federal law. If a federal statute preempts a state law, then a claim which falls under the penumbra of that statute, even if pled as a state law claim, is properly removed to federal court pursuant to 28 U.S.C. § 1441(b). See Beneficial Nat'l Bank v. Anderson, 539 U.S. 1, 8, 123 S.Ct. 2058, 156 L.Ed.2d 1 (2003) (reversing remand based on applicability of National Bank Act, 12 U.S.C. § 85). Actions brought against federal officers may be removed "despite the nonfederal cast of the complaint;" if the defense depends on federal law, the federal question requirement is met. Jefferson County v. Acker, 527 U.S. 423, 431, 119 S.Ct. 2069, 144 L.Ed.2d 408 (1999).

Defendants rely upon the federal officer removal provision, 28 U.S.C. § 1442(a)(1), for their claim that removal is proper. In order to satisfy the requirements of the statute, defendants must satisfy three elements: 1) that they have a colorable federal defense to plaintiff's claims; 2) that they acted under the direction of a federal agency or officer; and 3) that there is a causal nexus between the conduct in question and the federal authority asserted. Mesa v. California, 489 U.S. 121 at 124 -131. The

federal officer removal statute is construed broadly and "should not be frustrated by a narrow, grudging interpretation." Arizona v. Manypenny, 451 U.S. 232, 242, 101 S.Ct. 1657, 68 L.Ed.2d 58 (1981). Defendants need not show that they will prevail in federal court; they need only demonstrate that section 1442(a)(1) is applicable to the instant matter. Willingham v. Morgan, 395 U.S. 402, 407, 89 S.Ct. 1813, 23 L.Ed.2d 396 (1969).

In order to satisfy the requirement that defendants show that they were acting under the color of a federal agency or officer, defendants must demonstrate that there was direct and specific control on the part of a federal agency or office over defendants' work and that defendants performed the work pursuant to this control. Mesa v. California, 489 U.S. at 131-32.

In this case, defendants must demonstrate that the Navy had complete control over all aspects of their work regarding the manufacture and sale of defendants' equipment to the Navy, that the Navy had the sole authority to dictate the warnings affixed to or provided with the equipment and that defendants complied with these specifications. Plaintiffs must show that defendants did not perform their work only under the auspices of the Navy and that there was some autonomy on the part of defendants as to their fulfillment of the federal contract.

Plaintiffs allege that defendants cannot invoke the Federal Officer Removal Statute as a defense because the federal government did not exercise complete control over defendants' ability to include wamings regarding the presence of asbestos in the turbines. The Court agrees with plaintiffs.

Plaintiffs assert that the Navy, while setting forth explicit requirements regarding

warnings that it, as a federal agency, demands, did not preclude defendants from including other warnings of their own as dictated by state law and regulations. Plaintiffs have provided military specifications ("milspecs") issued by the Navy that specify that its "instruction apply[ing] to the labeling of all hazardous materials throughout the Naval Establishment wherever distribution of hazardous chemicals and materials is made to the actual consumer . . . is not intended to govern: a) The type of labels to be affixed by the manufacturer. These are governed by State and Federal Law and regulations. . . ." Plaintiffs' Ex. F. Defendants, therefore, were free to include warnings not dictated by the Navy. Whether they chose to do so or not is the subject of this lawsuit. It appropriately should be resolved in state court.

CONCLUSION

For the foregoing reasons, the Court GRANTS plaintiffs' motion to remand [Doc. # 8]. The Clerk is instructed to remand this case to state superior court.

Dated this 5th day of March, 2007 at Bridgeport, Connecticut.

/s/
Warren W. Eginton
Senior United States District Judge

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PROOF OF SERVICE

I am employed in the County of Marin, State of California. I am over the age of 18 years and am not a party to the within action. My business address is 222 Rush Landing Road, Novato, California 94948-6169.

On August 13, 2008 I served the attached:

DECLARATION OF RICHARD M. GRANT IN SUPPORT OF PLAINTIFF'S RESPONSE TO CARRIER CORPORATION' OPPOSITION TO MOTION FOR REMAND

on the interested parties in this action by transmitting a true copy thereof in a sealed envelope, and each envelope addressed as follows:

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XXX BY OFFICE MAILING: I am readily familiar with this office's practice of collection and processing correspondence, pleadings and other matters for mailing with the United States Postal Service on that same day with postage thereon fully prepaid at Novato, California in the ordinary course of business. I placed in the outgoing office mail, the above-described document(s), in a sealed envelope, addressed to the party(ies) as stated above, for collection and processing for mailing the same day in accordance with ordinary office practices.

Executed this **August 13, 2008** at Novato, California.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

JANE A. EHNI

G:\POS\MULTIP.WPD